FEBRUARY 3, 1964

OFFICE OF DIRECTOR – MSFC

CODE	NAME	INIT.	☐ ACTION	☐ INFORMATION
D&P-A	Mr. Bormon			

REMARKS

CODE	NAME	DATE
D/P	F. Williams	2/10/64

MSFC - Form 495 (Rev August 1963)

NOTES TO MUELLER 2-4-64 DEBUS

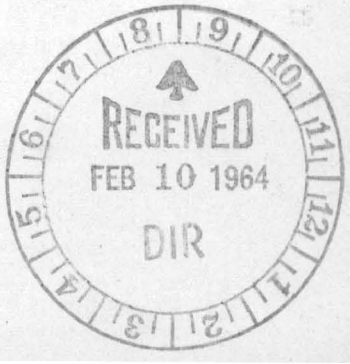
1. SA-6: Revised delivery dates were received from Saturn 1/1B Project Office for the vehicle as well as from MSC POD for the spacecraft. With the indicated delivery dates, it appears that the earliest launch attempt could occur the first part of May.

2. Structural Steel for VAB: The first increment of steel was erected on 20 January 64 in the low bay area.

3. FEC Railroad: The strike problem of the FEC operation on Merritt Island appears to be reaching a climax (weekend of 2 Feb.). The attempt of Blount to unload two cars of steel may trigger the general strike on MILA. Will keep you posted as the events unfold.

4. KSC Reorganization: The approved organization changes went into operation 4 February 1964.

5. Tabulation of MILA Construction Bids: The summary attached indicates a rather extensive effort. All items listed were accomplished during month of January.



TABULATION OF BIDS - JANUARY 1964

ım st.	Item	# of Bids	Apparent Low Bidder	Low Bid	High Bid	Government Estimate	% of Diff. Low Bid & Government Estimate
6, 090	VAB - Package 5	4	Morrison-Knudsen Perini & Hardeman	$63, 366, 378	$74, 343, 696	$61, 260, 531	+3
9, 000	Utilities for Apollo Static Test	6	Georgia Electric Company	$ 991, 462	$ 1, 118, 925	$ 1, 129, 525	-1
0, 000	FCA (Incl. AF Bldg)	6	W. V. Pangborne & Lowry	** $ 1, 443, 289	$ 1, 571, 359	$ 1, 422, 423	+1
4, 000	KSC Headquarters	6	Franchi Constr. Company	$ 7, 112, 913	$ 8, 738, 000	$ 7, 740, 874	-8
5, 000	Cafeteria	4	Bucon Inc.	$ 568, 565	$ 657, 914	$ 598, 276	-5
5, 000	CIF	4	Blount Constr.	$ 6, 261, 600	$ 7, 097, 333	$ 5, 643, 456	+11
5, 000	Auditorium & Training	5	H. J. High	$ 361, 677	$ 393, 000	$ 350, 538	+3
0, 000	LC-39 Industrial Water	5	Natkin & Company	$ 1, 733, 006	$ 1, 992, 000	$ 2, 031, 274	-14
8, 000	Water Supply for Central Telemetry & South Repeater Sta.	9	Boyce Company	$ 51, 140	$ 118, 675	$ 71, 475	-28
2, 090				$81, 890, 030	$96, 030, 902	$80, 248, 372	+2

onal funds being programmed to meet CWE
Share - $956, 455; DOD Share - $486, 834
I - $4, 300, 000; Phase II - $3, 214, 000

TABULATION OF BIDS - JANUARY 1964

	Program Cost Est.	Item	# of Bids	Apparent Low Bidder	Low Bid	High Bid	Governme Estima
	$64,756,090	VAB - Package 5	4	Morrison-Knudsen Perini & Hardeman	$63,366,378	$74,343,696	$61,260
	$ 1,389,000	Utilities for Apollo Static Test	6	Georgia Electric Company	$ 991,462	$ 1,118,925	$ 1,129
*	$ 540,000	FCA (Incl. AF Bldg)	6	W. V. Pangborne & Lowry	** $ 1,443,289	$ 1,571,359	$ 1,422
***	$ 7,514,000	KSC Headquarters	6	Franchi Constr. Company	$ 7,112,913	$ 8,738,000	$ 7,74
	$ 615,000	Cafeteria	4	Bucon Inc.	$ 568,565	$ 657,914	$ 59
	$ 7,195,000	CIF	4	Blount Constr.	$ 6,261,600	$ 7,097,333	$ 5,64
	$ 475,000	Auditorium & Training	5	H. J. High	$ 361,677	$ 393,000	$ 35
	$ 2,000,000	LC-39 Industrial Water	5	Natkin & Company	$ 1,733,006	$ 1,992,000	$ 2,03
	$ 248,000	Water Supply for Central Telemetry & South Repeater Sta.	9	Boyce Company	$ 51,140	$ 118,675	$ 7
TLS	$84,732,090				$81,890,030	$96,030,902	$80,24

*Additional funds being programmed to meet CWE
**NASA Share - $956,455; DOD Share - $486,834
***Phase I - $4,300,000; Phase II - $3,214,000

NOTES 2-3-64 BELEW B 2/9

J-2 ENGINE PROGRAM

Two of the three engine system test stands currently in operation are being used to evaluate warm-up rates on pre-chilled thrust chambers and start bottles in support of vehicle design. Engine hardware availability is still the main delay to testing.

Six engine system tests were conducted for an accumulated time of 618 seconds. One test had a duration of 501.6 seconds.

One of the engine test experienced a GG valve failure at cutoff causing considerable damage to the fuel turbine and hot gas system. A design change to eliminate the galling problem with the GG valve will be initiated before the next hot test.

Random high-side load spikes recently have been experienced on engines equipped with diffusers, casting some doubt on the effectiveness of the diffuser. The effect of nozzle eccentricity on side loads is being investigated.

J-2 engine simulator J205 was bought-off by the government on January 27.

H-1 ENGINE PROGRAM

Rocketdyne is conducting an informal 200K design and development review at Canoga Park this week for the benefit of MSFC personnel.

Incentive proposal guidelines for conversion of production Contract NAS7-162 are being prepared at MSFC for submission to Rocketdyne by early February 1964.

RL10 ENGINE PROGRAM

Dr. Mueller, Mr. Discher and Mr. King of NASA Headquarters visited the Pratt & Whitney Plant last week accompanied by myself and Mr. Young. Dr. Mueller observed an idling and re-start test of the RL10 engine and operated the thrust control lever in a throttling demonstration. P&WA presented their work on cryogenic service module and high pressure engine studies as presented to you two weeks before. Dr. Mueller appeared favorably impressed.

F-1 ENGINE PROGRAM

Injector 081 without film coolant has been tested in a tube wall thrust chamber to determine the effect on tube erosion. No tube erosion was experienced in 15 short duration tests.

Engine F-1002 is being installed on Test Stand 1B-1 for acceptance tests following replacement of the thrust chamber.

NOTES 1/31/64 CONSTAN

1. S-I-8

Replacement of critical tubing is continuing. To date 391 of 538 tubes has been replaced. Cable rewrapping, continuity and megger, and critical tube replacement is scheduled for completion February 8, 1964. At this time final functional testing will be resumed.

B 2/9

NOTES 2-3-64 DANNENBERG

1. Panel Review Board - Dr. Mueller reaffirmed that he will continue to chair the Board, and that the panel structure will remain permanent and will not be affected by W. Williams' operational reviews. He considers Flight Mission Planning on a higher level than other panels and decided, therefore, against a Flight Mission Planning Panel. MSFC will form a centerwide Flight Mission Planning Group. All panel scopes were approved with minor modifications. MSFC requirements for Q-Ball/LES and dynamic test hardware for IB to be delivered by MSC are going to be reviewed by next PRB meeting. Fichtner and Palaoro gave good surveys on their respective panel activities.

2. Saturn Flight Missions - Piland will discuss MSC Flight mission concepts (incl. IB EOR; IB reentry flights) with MSFC (IO and R&D), Bellcomm (Tommy Thompson) and KSC in Huntsville, this Tuesday. You will get summary presentation.

3. NAA Cost reduction proposals for S-II were reviewed by R&D. Deletion of PU System and replacement by PMR (Programmed Mixture Ratio Control System) was recommended, also retaining the LH_2 recirculation system, rather than over-board venting.

NOTES 2-3-64 FORTUNE B 2/9

1. Understanding With GE: Understanding was finally reached Saturday a.m. Jan. 25, when P&C and MTO personnel met with Bill Eaton and his top men. They agreed to provide their initial staffing plan in a few days, and operating plans within 60 days, not taking on added personnel without prior approval. Eaton was very responsive, stating he wanted to work closely with us. Friday, 31 Jan., all negotiations were concluded, for total price of $3,139,500, including fee of $168,250. This represents real progress on our part.

2. Support Contracts at Air Force Missile Test Center and Kennedy Space Center: Monday and Tuesday afforded opportunity to look into AFMTCR and KSC procedures. Col. Kirkland, Administrative Contracting Officer, described Pan Am's role, organization, working relationships, etc. This year's contract was for $138 million, fee $1,750,000 (1.36%) approximately 6900 men, RCA being awarded subcontract for $30 million, fee 3.04%, and 3500 personnel. Al Siepert discussed the seven different support areas they are contracting for, i.e., Communications (RCA), Administrative and Management services, somewhat misleading in that it refers to tech writing, photo reproduction, admin computer work, etc., (Ling-Temco-Vought), Base Operations Services - all the house-keeping functions, security, fire, medical, maintenance, shops, custodial, ($20 million or so, not yet awarded, some 20 firms competing), Instrumentation, (not announced), Launch Support Services - crawler ops, close-in communications, pad safety, precision shops, etc. (not selected), Engineering Design, facilities criteria development, design parameters, eg. crawler, umbilical tower, etc. (not announced). Bechtol also has a level of effort contract to perform Davis-Bacon type building trades work. Food service will be handled by an Exchange Council on a non-appropriated fund basis, Mackey Vending Co. winning the competition.

Bob Young And they say MSFC has too many people" B

AF contract

KSC (additional contracts)

BF Department of Defense should have many precedent cases for such situations! B

3. Hancock County Roads: cannot be paid for, in legal opinion of Corps of Engineers. Ed Guilian discussed this at Headquarters Friday. If we can find no basis for compensating county by 10 Feb. meeting with Board of Supervisors, we should be prepared for more road blocks, Corps request for court injunction and condemnation proceedings, and local indignation.

4. Meeting with Governor and Mississippi Legislation: Tuesday night after the Legislative Banquet which Dr. McCall and I attended in Jackson, Miss., I met Gov. Johnson, State Senators and Assemblymen. All expressed sincere appreciation for our being there and promised that they would work with us on local problems. We may well need their help in Hancock County.

Jerry McCall Hope you've got in touch with Rip Young on this B

fw 2/3

NOTES 2/3/64 GEISSLER B 2/9

1. Real Time Data SA-5: The real time experiment conducted in Building 4663 was reasonably successful. Fifteen (15) telemetered measurements received from Green Mountain station from 125 to 449 sec of flight were displayed. GSFC transmitted good trajectory data which were plotted with only 20 sec time lag. The Burroughs 5000 computer displayed in near real time six derived flight parameters. ✓

2. Apollo Reentry Studies: A study was conducted to determine whether the Saturn IB with SM could perform the Apollo Reentry Mission. Assumptions were: (A) No coast between power shut-off and reentry; (B) Reentry was defined as 121.9 km altitude and -5.5° flight path angle (MSC prescription); (C) CM control weight was 9,500 pounds; (D) SM Control Weight (composed of 8,000 lbs. dry weight, less 295 lbs. life support equipment, and 2,500 lbs. residuals) was 10,205 lbs. (SM was assumed to be fully loaded only in the 3 stage continuous burn profile). Results showed that the 3 stage continuous burn profile gave approximately 9,480 m/sec reentry velocity and the 3 stage profile using a parking ellipse with a restart of the SM gave approximately 9,800 m/sec. In order to meet the specified reentry velocity of 11,033 m/sec, the CM must be limited to 3,100 lbs. in the case of the elliptical profile. Another study which considered a 2 stage continuous burn profile was conducted. Assumptions were: 9,500 lbs. CM weight, and coast and reentry conditions used were the same as specified in the above reported study. This 2 stage continuous burn profile resulted in approximately 9,600 meters per second reentry velocity. (Studies concerned with continuous burn to reentry (2 and 3 stage) were based on stage weights of flight vehicle SA-201, current in Dec. 1963.) ✓

NOTES 2-3-64 GRAU B249

1. S-I-6 CHECKOUT: Performance testing of the S-I-6 stage will be completed upon replacement and recheck of the hydraulic supply pressure transducer on engine number two.

2. S-I-9 PRE-STATIC CHECKOUT: The S-I-9 stage is presently located in the pressure cell of building 4705 undergoing pressure and functional check-out. Difficulty is being experienced due to lack of replacement components for rejected pressure switches and valves.

3. S-IVB PROGRAM: The S-IVB checkout facility is considered unsatisfactory by this Laboratory, in that it is located in the same building with the S-IVB assembly (welding) and cleaning (de-greasing) operations. We are coordinating with Industrial Operations in an attempt to arrange a meeting with DAC to discuss this situation.

4. J-2 ENGINE COMPONENT QUALIFICATION: Component qualification testing on the J-2 engine is scheduled to start in April, 1964, and is to be completed by mid 1965. The final draft of the "J-2 Propulsion System Reliability Plan" is being reviewed by Rocketdyne. It is anticipated that the plan will be submitted to MSFC for final approval about February 17, 1964.

5. MEASURING SYSTEM CALIBRATION: In an attempt to reduce the number of measurements needing adjustment at KSC, this Laboratory has taken the following actions: (1) All amplifiers are being adjusted to a tolerance of .2%. (2) Telemetry sub-carrier oscillators are being adjusted to ± 5% of full deviation, the tolerance which is now being used during pre-launch testing at KSC. With present hardware design, it is not anticipated that adjustments at KSC can be eliminated by utilization to these tighter tolerances. Actual drift rates determined on 199 amplifiers for S-I-6 over a four month period are as follows: 36 required no adjustment; 69 indicated .2% change; 42 indicated .4% change; 22 indicated .6% change; 18 indicated 1.0 to 1.5% change; 5 indicated 1.6 to 2.3% change; 5 indicated 2.4% to 4.0% change; and 2 amplifiers indicated over 4.0% change.

6. AEROJET-GENERAL CORPORATION RELIABILITY PROGRAM PLAN: The Aerojet-General Corporation Reliability Program Plan for the Mississippi Test Facility instrumentation and control systems has been received and reviewed. The plan appears to be an adequate response to the reliability requirement scope of work, which was developed by Test Laboratory with counsel of personnel from this Laboratory. Test Laboratory will request contractual coverage from Purchasing Office.

7. SUPPORT TO ASTRIONICS SATURN V BREADBOARD OPERATIONS: An agreement has been reached between Astrionics Laboratory and Quality and Reliability Assurance Laboratory whereby we will provide GE 215 computer support to their Breadboard operation which is to be located in building 4708.

NOTES 2-3-64 GRUENE

1. SA-5 Launch

a. In addition to our Quick Look Report of Wednesday/Thursday, the following information was received. Out of the seven recovered camera units, one was damaged so that the film was not useable; two were slightly damaged, but the film could be processed. Our Measuring personnel who saw the first films thought they were highly satisfactory.

b. It was not mentioned in our Quick Look Report that the RCA 110 System utilized for automatic passenger guidance system checkout and for automatic sequencer monitoring of S-I, IU, and GSE worked excellently through both counts. This should raise our confidence level for our automatic checkout system.

c. In order not to delay the following Saturn I vehicles due to the launch delay of SA-5 (cracked sleeves, helium bottles), we had cut our estimation of a four-week refurbishing time of Pad 37 to an optimistic two weeks. Visual inspection of the Pad after the launch confirmed our latest estimation of two weeks, so we could be ready to receive the S-I stage around February 12, but definitely at its presently scheduled arrival date of February 19.

2. SA-6 Launch

I would like to make you aware of the fact that in SA-6 we carry, in addition to the SA-5 instrumentation systems, three more telemetry links on the spacecraft, two C-Band Beacons on the spacecraft, and ODOP (Offset Doppler) System in addition to the UDOP in the launch vehicle. The interference history of SA-5 scares us with this number of active RF systems. It might have to be decided, in coordination with Dr. Speer and Mr. Hoberg, that some of the systems have to be eliminated in case we run into serious problems.

NOTES 2/3/64 HAEUSSERMANN B 2/2

1. Superconductive Gyro Program: On 1/29 & 30/64 Dr. Stuhlinger and I participated in a review of the superconductive gyro program at GE in Schenectady. For the first time, drift rate measurements have been obtained. The comparatively crude test set-up yielded random drift values of 0.005 degrees/hour over a nine hour period. This result is very encouraging and we decided to continue with equal importance on superconductive material research and gyro development to simplify the system.

2. Fuel Cell Status: Personnel from MSFC, MSC, and LeRC met for a NASA Fuel Cell Coordination Meeting 1/28. Mr. Scott (OART Space Power Program) in co-operation with Mr. Esenwein (OMSF) called the meeting as a result of Dr. Mueller's request to support Allis Chalmers's activities with OART funds.

OART has tentatively agreed to expand their support of the A-C fuel cell at the request of OMSF. Of primary concern was a back-up system for Gemini which is presently 8 months behind schedule. The funding and effort limits are yet to be approved by Dr. Bisplinghoff and Dr. Mueller.

An 18 month program was outlined at the meeting with preliminary prototypes due in one year. The group agreed that a $1.5M program was conservative even with support hardware and testing supplemented by NASA.

The present R&D contract will have to be modified to include specific requirements for Gemini. After much discussion, OART and OMSF personnel agreed to keep the management of the program with MSFC. However, it is felt that MSFC will have to show more in-house capabilities to acquire such programs in the future. WH.

→ In the Fuel Cell area??? B

NOTES 2/3/64 HEIMBURG B 2/9

1. F-1 TESTING (STATIC TEST TOWER WEST):

Three tests were conducted on the F-1 engine during the week of 1/27. The first test was cut off prior to reaching main stage due to a faulty overspeed trip signal. A decision had been made by Rocketdyne and MSFC to delete the overspeed trip signal on all F-1 engine firings, but it was inadvertently left in the system during this test. The second test attained 26 seconds of mainstage, and no damage to the engine was noted. The third test attained 101 seconds of mainstage. After-test inspection revealed excessive erosion of one chamber tube, 6 inches below the injector. This tube will be replaced prior to the next test, which is tentatively scheduled for 2/6 or 2/7.

The fuel pump inlet pressure was lowered approximately 9 p.s.i.g. during the second and third tests, respectively. This resulted in the third test being the first time that the F-1 engine had been run with the predicted S-IC pump inlet starting pressure. Neither Rocketdyne nor Edwards Air Force Base are able to run the F-1 engine under these conditions, due to the high pressure losses in the inlet suction lines used at these facilities. The temperature spike in the gas generator is still very high. The effect of this spike is not severe enough to damage the turbine; however, the effect of this condition on turbine life is not presently known. This condition will be fully monitored during future tests to determine the adverse effects, if any.

2. MTF WORKING GROUP:

An RFQ covering the initial procurement increment under the approved procurement plan for Phase II and Phase III MTF Technical Systems ~~is being~~ was forwarded to GE ~~today~~, on 2/3, with a return date for the proposal of 3/8.

Realignment of plant and test support and the extension of facility activation for five months, to 7/1/64, was negotiated with GE on 1/30.

3. MARINE TRANSPORTATION:

The Chrysler S-I transportation plan has been reviewed. It is our opinion that Chrysler is calling for too many personnel (5 vs. 3 presently used by MSFC) for this effort. This information has been documented to Saturn I/IB Project Office (Capt. Cunningham).

Preparation is presently underway to ship the S-I-6 stage on 2/7 to the Cape.

fw 4/3

B 2/9

NOTES 2-3-64 HOELZER

1. NASA INTER-CENTER COMMITTEE ON ADP: This committee, with participation from all NASA Centers (including JPL), is meeting regularly to formulate NASA policy in the computer field. Mr. Bradshaw has been appointed chairman of a committee to study NASA ADP management and, among other things, to establish the NASA position on lease versus purchase of computers. This committee will also attempt to streamline reporting procedures within NASA as relates to computers and will be furnishing information to Headquarters relative to congressional hearings.

2. PRINCE SYSTEM: The Parts Information Center (PRINCE) system will be demonstrated at the Inter-Service Data Exchange Program (IDEP) convention in Orlanda, Florida, February 27 and 28, 1964. The demonstration will consist of a teletype inquiry into the MSFC Data Center files from Martin, Orlando. The files contain parts test and failure information. A reply will be prepared by the 1410 Data Center computer and wired back to Orlando in a matter of a few minutes. Inquiries into the MSFC system can be received from Aerospace manufacturers, Universities, and other NASA Centers throughout the country. The PRINCE system is an early application of the MSFC Data Center concept. The Astrionics Laboratory is the sponsor of the PRINCE project.

3. GE APOLLO SUPPORT FOR MSFC DATA CENTER: The MSFC Data Center which is scheduled for official inauguration in late September 1964, requires certain computer support and staff which is not now available. However, we are discussing with Dr. McCall and others, the desirability of using GE Apollo personnel for some phases of this operation. The Apollo resource seems to be the only one available since our present GE contract is frozen at current levels.

NOTES 2-3-64 JAMES

SATURN I - SA-5 - The SA-5 Post Launch Review for MSFC management is scheduled for Friday, February 7, from 2:00 to 4:00 P.M. in the 10th Floor Conference Room, Bldg. 4200. The S-IV helium bottle testing results will be given by DAC and recommendations for S-IV-6.

S-IV-6 Stage - Checkout continues on the S-IV-6 stage with delivery to AMR scheduled for February 26, 1964. Effort will be made to advance this date a few days if possible.

I. U. - Testing - IU-9 vibration test unit is located on the "Shaker" at Wyle Laboratory with testing scheduled to begin February 3, 1964. Testing may be intentionally delayed several days to allow an analysis of vibration inputs to IU-5 during the SA-5 flight. This is desired to more accurately simulate flight conditions on the "Shaker". IU-9 structural testing is complete, and the test unit is now scheduled for SA-9 dynamic test.

SATURN IB - Capacitance Probe Installation - An agreement between S-I/IB, LVO and P&VE has been reached that the capacitance type liquid level indicator will be installed in the center LOX tank only for the S-IB Dynamics and Facility Stage and the first two flight units, and the center LOX tank and fuel tank #4 in subsequent flight stages. This installation will require no new tanks. The Delta P probes will remain in the tanks also. Plans are to give Chrysler a go-ahead later this week.

S-IVB - Hydrostatic Test and Dynamic Test Stage - The Air Force and NASA representatives met on January 29, 1964, to discuss the withdrawal of the Air Force hold tag on the hydrostatic forward dome. This was necessary in order to permit DAC to rework the hydrostatic dome for possible use on the Dynamic Stage. The decision has been made to use the forward dome of the Dynamic Stage on the Hydrostatic Stage. This problem is not expected to cause a delay in the approved Saturn IB delivery and launch schedule.

S-IVB - Effect on H-1 Up-Rating - Regarding your question on my 1-20-64 notes concerning DAC's evaluation of the effects on the S-IVB/IB program of up-rated H-1 engines, this office has not accepted any firm position at this time. DAC is evaluating the affects of both increased bending loads (considered to be the major effect) and up-rated engines. An action item from Vehicle Mechanical Design Integration Working Group has been placed on DAC for this information by February 26, 1964. The comments reported to you on 1-20-64 were unofficial and DAC management would not comment on these until their evaluation is completed.

SATURN IB Dynamic Test Program - R-ME has indicated that facilities will not be available at MSFC to modify SA-D5 to the S-IB Dynamics and Facilities configuration. The S-I/IB Stage Office is investigating the impact of CCSD performing this modification at Michoud.

fwX 4/3

NOTES 2-3-64 Koelle B 2/3

1. SATURN IB MARKET DEVELOPMENT: Ed Gray's office has called the first meeting on February 12, 1964 concerning SATURN IB uses beyond the APOLLO program. (This action was prompted by our insistence that now is the time to worry about it.) I will attend the kick-off meeting, along with one representative from Mr. Dannenberg's office and one from Col. James' office. It is primarily an organizational meeting with all program offices participating. We are expected to make a one-hour informal presentation on leadtimes, performance and cost.

Very true! B

2. NASA POLICY COUNCIL MEETING: I am all set for a discussion of reusable launch vehicles this Wednesday at Headquarters. I have a 30-minute slide presentation and supporting material. I would like to take a fairly strong position in support of reusable vehicles for the next generation(s), if this is alright with you. Do you want a run down on what I intend to present?

Suggest you do it on anytime or after coming in Wash. fw

→ It is.

→ If we can squeeze it in my schedule before you leave, yes. B

→ HHK

Hans Thaus has some important input re FY66 budget planning. Please discuss this with him prior to the 2/12 meeting B

fw 2/3

NOTES 2-3-64 KUERS B 2/9

Saturn V, S-IC Stage:

The structural assembly of the T-Vehicle is not making good progress and is already falling behind schedule VI. There are three major reasons for this delay:

1. Documentation releases for approved changes are not on schedule. I have discussed this with Mr. Heimburg who will see Mr. Stoner this Thursday with sufficient evidence and facts in order to request a drastic change of attitude of Boeing design engineering with respect to schedule commitments. ✓

2. It takes too much time to obtain decisions on approval or disapproval of deviation which occur during manufacturing. We have several cases where gore segments and complete bulkheads are held up for 2 months for this reason. I am not pleading for acceptance of marginal hardware but I need faster decisions whether parts and subassemblies are good or not to meet my schedules ✓ We had meetings with Mr. Heimburg, Mr. Grau, Mr. E. Hellebrand and others to resolve some of the most urgent cases. ✓

By whom?

3. The rewelding of the y-ring to the upper fuel tank bulkhead of the T-Vehicle was completed over the week end. At least 60 repairs will be necessary to get this weld into an acceptable class II range. Extended horizontal welding requires still more development, a specific program was started with Boeing. ✓

Karl Heimburg

Klaus can I get that promised status and problem briefing on SIC-T 2? B

NOTES 2-3-64 MAUS B2/9

1. CURRENT ACTIVITIES - The following are some of the major activities and deadlines that we are working toward:

Feb. 7	Submission of the Program Obligation Plan to MSF
Feb. 11	Meeting with Dr. Mueller "FY-65 Manpower Reclama"
Feb. 12-13	Meeting in Headquarters of the Standing Committee on "MSF Program Scheduling and Review Procedure"
Feb. 13	Internal Management Review of status briefing to be given at the next Management Council Meeting, and
	Review status of action items
Feb. 17	Submission of Schedules to MSF (level 2, 3, and A with selected levels 4 and B)
Feb. 18	Program Management Council Meeting

2. TEAGUE SUBCOMMITTEE HEARINGS - A rough draft of the transcript of the January 24 hearings was forwarded to NASA Headquarters January 30. This draft is being reviewed by the MSFC people who were witnesses at the hearings; Ray Kline provided a copy to you on Friday for your personal review and edit. Final transcript is due in Headquarters February 6, 1964. Was done & returned to Ray B

In response to a request from Wes Hjornevik to Mr. Gorman, Ray Kline has provided a copy of the transcript and other information that may be of benefit to the Houston people in connection with the Teague Hearings scheduled to be held in Houston next week. ✓

fw 4/3

NOTES 2-3-64 McCartney B 2/9

Year-End Unencumbered Funds Study: The first phase of the Saturn V detailed review to identify probable end-of-year unencumbered funds has been completed. During this phase of the study, laboratories submitted their estimates for analysis by Mr. Bush's group of my office and FMO. That study indicates a total of approximately $44M (based on the November 10 POP) which we might apply elsewhere. As previously reported, we have already made $25M available to Industrial Operations. To date $21M has officially been transferred. ✓

Phase 2 of the Saturn V study began last week with laboratories reviewing our proposed unencumbered funds total of $44M. That figure may be reduced where specific subjects in R&D Operations, requiring more funds, are clearly identified. As we have no further requests to this date from Industrial Operations for more money, Phase 2 of the Saturn V funds study will be completed by placing probable unencumbered funds in "blocked" accounts to be used until April 15 wherever the most pressing need arises. At that time, another evaluation will be made of the anticipated Fiscal Year-End Unencumbered Funds status, and decisions will be made on the disposition of the remaining funds. Makes sense B

Similar studies are being completed for Saturn I and IB. Results will be reported to you as they become known. ✓

OFFICE OF DIRECTOR – MSFC

CODE	NAME	INIT.	☐ ACTION	☐ INFORMATION
Willy Mrazek				
I agree 100	per cent with			
Frank. There's	virtually no			

REMARKS

Note other way to get started B

Regarding item #5

I feel it is too early to commit your self to this.

First, we should decide, # jointly with MSC, what we want to do and get Hyds backing.

Second, we should get a "plan" documented as to how, who, when, what, etc the activity incl. testing (what will be run. test stands etc) Use of left-over RL10 engines etc

Then - and only then decide who will carry the ball.

fw 2/3

"lets worry about who carries the ball after we get it."

CODE	NAME	DATE

MSFC - Form 495 (Rev August 1963)

NOTES 2-3-64 MRAZEK B 2/9

1. H-1 ENGINE (200K): The fourth engine has accumulated 2,100 seconds total duration; three engines previously tested accumulated 3,000 seconds each. Three major problems are: LOX pump bellows seal (three failures), turbine exhaust hood (three failures), and self-induced instability (three out of four injectors).

2. SA-5: Preliminary test data indicates a highly successful flight for S-I-5. Pertinent preliminary data are as follows:

Event	Predicted	Actual
Inner Engine Cutoff	140.6 seconds	140.4 seconds
Outer Engine Cutoff	146.6 seconds	146.4 seconds
Cutoff Velocity	3,052 meters/second	3,081 meters/second

Predicted orbital life of S-IV-5 stage and payload is approximately 472 days. The launch appears to be highly successful with an actual burntime of 480.9 seconds compared to a predicted 482.1 seconds. Only a small amount of LOX was observed to be forced overboard through the LOX vent system during helium bubbling.

3. S-IV ALL-SYSTEMS VEHICLE: An attempt to fire the All-Systems Vehicle on 1-24-64 was automatically aborted prior to ignition by an indication of no vacuum in the engine diffuser system. The first of a series of explosions occurred 53 seconds later. Preliminary data indicates that the LOX tank was overpressurized and ruptured. The cold helium pressurization valve in the LOX pressurization system failed; both LOX vent valves also failed and overpressurization ruptured the LOX tank. Additional reports will be made as soon as information is available.

4. F-1 ENGINE: (Reference NOTES 1-20-64 MRAZEK, paragraph 5c.) The cause of the primary bellows squirming was insufficient bellows support during proof-pressure test. Clips are being fabricated and welded to the compensator cage to provide additional support to the primary bellows. The clips will be installed in the development test unit and the assembly will be proof-pressure tested to 285 psi.

WM See attached note B

5. CRYOGENIC SERVICE MODULE: I propose that that this Laboratory be the lead laboratory in the Cryogenic Service Module program and that Mr. Arnold Stein of the Advanced Studies Office (R-P&VE-A) be the coordinator and checkpoint for supporting research and technology programs directly concerned with, or leading to, a cryogenic service module.

6. S-II STAGE RECIRCULATION SYSTEM: In a meeting between Space and Information Systems Division, North American Aviation, Inc., and MSFC on 1-30-64, it was decided to retain the LH_2 and LOX recirculation system on the S-II stage in lieu of an overboard bleed system.

7. RIFT CONTRACT NAS8-5600: Dave Novik, from Harry Finger's NASA Nuclear Systems Office, has informed Nuclear Vehicle Projects Office (NVPO) that Headquarters does not wish to approve the MSFC recommendation for RIFT work phaseout under the existing contract with Lockheed as proposed in teletype to Dr. Bisplinghoff on 1-20-64. Mr. Novik said that Headquarters wants "out" and wants to cancel not only the RIFT project, but the contract document as well. This desire to completely remove all traces of RIFT is based, according to Mr. Novik, on high-level Headquarters commitments. NVPO, in close coordination with the contracting personnel in Purchasing Office, had planned to use the existing contract as an instrument, on a continuing basis, for Lockheed to do RIFT-type work of interest to not only a nuclear technology program, but also to other Saturn V projects.

W.M. Bisplinghoff told me the same B

What is our action plan now that this is so? B

Attachment #1: NOTES 1-20-64 MRAZEK

(Mr Webb to the President) B

NOTES 2/3/64 RUDOLPH B2|9

1. S-IC Stage:

MTO Activation - Evaluation of Boeing proposal for activation of MTO is expected to be completed by February 10, 1964. Preliminary indications are that the technical statement of work is acceptable to MSFC and negotiations are tentatively set for mid-February. It is expected that during the remainder of FY64 the design for MTO peculiar equipment will be completed and procurement initiated for long-lead hardware.

S-IC-T Weld - Newly fabricated transition piece for inboard LOX tunnel on lower fuel bulkhead (S-IC-T) has been successfully welded. Previous transition piece had to be scrapped due to faulty weld. Solution of this weld problem averted a major assembly problem. This is a hand weld solution for S-IC-T only; continuing study of automatic welding for future stages is still in process.

S-IC-T Thrust Structure - The S-IC-T thrust structure assembly is reported to be on schedule. Delaying problems are being solved and the assistance of a second shift operation is presently being utilized to maintain schedule.

→ But the rest of S-IC-T is A.R. seriously delayed, according to Kuers !

2. S-II Stage:

LH_2 Recirculation System - During a review with NAA it was determined that the cost savings previously proposed by NAA for deletion of the LH_2 recirculation system and incorporation of an overboard bleed system were not $7.5 M, but probably considerably less than $2.0 M. Therefore, the proposed change will not be again considered on the basis of a cost savings.

Propellant Utilization (P.U.) System - Deletion of the closed loop capitance probe P.U. system was jointly reviewed by NAA and MSFC on January 30, 1964. Agreement was reached that 400 pounds payload would be gained by keeping the present P.U. system; however, by incorporating program mixture ratio an additional gain of up to 2,700 pounds is possible. The contractor proposed deleting the P.U. and incorporating the program mixture ratio. Differential cost savings are in the amount of approximately $8.5 M. Dr. Mrazek requested additional justification for the cost savings prior to his endorsement of the change.

3. S-IVB Stage:

S-IVB Huntsville Battleship Stage - Calibration of the battleship tank has been completed.

fw 2/3

NOTES-2-3-64-SHEPHERD B 2/9

F-I Test Stand at MTF: As you know, Congressman Teague and others, during the recent hearings at Huntsville, questioned us as to the projects that were submitted in FY-64, cut by either the House or Senate and not requested again in FY-65 by NASA. In particular, Congressman Teague was interested in the F-I Test Stand at Mississippi. As you recall, the House cut the project to $4.0M during FY-64 and after Mr. Webb's reclama, the Senate and House agreed to restore the project to a $6.541 level rather than the $9.0M requested by NASA.

The present status of the project is that it has been dropped from the FY-64 program by NASA Headquarters in order to apply that funding against an overall CofF cut made by the Congress. The exact answer given Congressman Teague was as follows: "Due to the subsequent development of rapid air transportation methods, a foreseeable requirement for the F-I Stand at Mississippi does not exist." The rapid air transportation referred to applies to the certification by the FAA of the Pregnant Guppy. This will allow an engine to be shipped back to Huntsville or the West Coast as the need arises.

I believe that the Congress will question NASA in some detail about this particular project. We find ourselves in a position of having to defend a $9.0M savings.

Sleep

→ I'll be glad to take that one on. It is typical for the effect of rigid, long-lead time planning procedures on a dynamic, fast-moving program B

NOTES 2-3-64 Stuhlinger

B 2/9

1. OMSF SRT SUMMARY FOR DR. MUELLER: During the past week, RPL has furnished Headquarters, OMSF, Advanced Manned Missions Program Office, a complete comprehensive list of FY-1963 SRT accomplishments, FY-1964 present effort, and anticipated benefits of the FY-1965 program. Sub-programs, task areas, and tasks were described as directed by Headquarters. A number of samples of alternate or improved components were also sent to OMSF for demonstration purposes.

This material will be used by Dr. George Mueller in Congressional Hearings beginning on February 4, 1964.

2. SA-10 Payload: OART will hold a two-day meeting in Headquarters on the SA-10 payload on February 6 and 7. It is expected that the experimental program will be established and firmed up in that meeting. A number of MSFC members will participate.

FEBRUARY 10, 1964

NOTES 2-10-64 BELEW B 2/12

F-1 ENGINE PROGRAM

To assist with the film coolant development effort, as related to the stability, performance and tube erosion, "H-1 for F-1" testing has been initiated at Neosho on two H-1 engines with various modifications in the three outer injector rings. ✓

J-2 ENGINE PROGRAM

A 3.5 second duration engine system test was conducted with the "iron-maiden" to evaluate side-load origin. Fire from an eroded hole in the GG terminated the test. The engine is being repaired at Canoga manufacturing facilities. Similar GG failures are occurring in component test.

Engine hardware availability is still the program pacing item. ✓

RL10 ENGINE PROGRAM

Personnel involved in advanced studies from Grumman Aircraft visited the MSFC RL10 Project Office on February 5 to explore the possibilities of adapting an RL10 engine to a cryogenic "descent" propulsion system for advanced lunar mission studies. ✓

Pratt & Whitney Aircraft has completed a series of tests on the E-5 vertical test stand, which indicates that elimination of the S-IV stage LOX system helium bubbling is feasible. ✓

H-1 ENGINE PROGRAM

The fifth 200K R&D engine is currently being subjected to hot-firing tests at Rocketdyne. Firing time of approximately 425 seconds has been accumulated in four tests. All engine R&D test results to date indicate that no major modifications will be required to satisfy 200K design and performance parameters.

According to Rocketdyne's latest projection, the first three production 200K engines will be delivered on schedule in March.

Lee B → I hear we have a major combustion instability problem at the 200K level - Is does this jibe with what you are saying? B

M-1 ENGINE PROGRAM

The Quarterly Design Review Meeting was held January 28 and 29, 1964. A new schedule was generated impacting budget cuts, design problems, and facility problems. The following major milepost schedule is now planned:

Thrust Chamber Tests - Start March 1964
Turbopump Tests - Start August 1964
Engine System Tests, Short Duration - Start February 1966
Engine System Tests, Full Duration - Start August 1969
PFRT - Complete May 1971

The aforementioned schedule represents an extension of 37 months over the previously planned 72 months for completion of PFRT. ✓

NOTES 2/10/64 CONSTAN B 2/12

*JW 1. Checkout of S-I-8

Checkout of S-I-8 has been discontinued because of rework and modification. All critical tubing assemblies have been replaced and at the present time, cable re-wrapping is continuing. All cable affected will be meggered. It is expected that this will be completed by February 10, 1964. All systems on S-I-8 are 100% complete except for the flame shields and instrument compartments #1 and #2. These units are approximately 98% completed. It is anticipated that testing will be resumed within the week. Tests to be run are power distribution, components, telemetry, measurements, cut-off test, and simulated plug drop. Testing should be completed by March 15, 1964. ✓

2. Checkout of S-I-10

Preliminary review of final acceptance procedure for the check-out of S-I-10 is now in progress. S-I-10 is now in final assembly and build up is continuing. The ~~locks~~ LOX and fuel containers and the fairing installation are 100% complete. The following are in partial completion status:

Tail Section	-	60%
Second Stage Adapter	-	90%
Flame Shield	-	50%
Replacing Tubing	-	35%

All in-board engines has been installed. Electrical harnesses and equipment are being installed; approximately 30% complete. It is expected that S-I-10 will be available to move to checkout area by April 10, 1964. ✓

Fw 2/10

NOTES 2-10-64 DANNENBERG

1. Q-Ball/LES Tower - MSC is still stalling on our requirement for an escape tower on SA-8 and 9 to support Q-ball, after Dr. Mueller, at the last Panel Review Board meeting, expressed doubts regarding our requirement for Alpha meters and requested new study by MSFC. You might be called upon to get into the loop.

2. Flight Missions - MSC's "mission flexibility" plan is supported by MSC's Cape group, (Preston, POD, Preflight Operations Division) which advocates a minimum number of payloads to be prepared in the checkout building with delivery choice to Pad (Saturn IB) or VAB (Saturn V) 60 days prior to launch. This viewpoint saves some S/C, manpower, and hardware for MSC, but increases manpower and booster hardware requirements for us. ✓

3. Manned Space Flight Experiment Board - Mr. Denicke, OMSF, secretary of both the Panel Review Board and the Experiments Board, has introduced our proposed changes into the charter of the Experiments Board. ✓

4. Manned Flight Awareness Program - Procurement requests for a semi-trailer for contractor displays and a film script were prepared. ✓

K.D.
Request a background briefing before I'm called in to defend it
B

Unrealistic!

K.D.
Our line: Every launch vehicle should have a S/C payload in the manufacturing schedule. B

Fw 2/10

B 2/12

NOTES 2/10/64 FORTUNE

1. Visitors Galore: Every day this week, we have had visitors from MSFC, NASA Audit Office, NASA Headquarters, Corps of Engineers, Mississippi State University and Rocketdyne. John Hill from Michoud brought Engine Logistics and Field Service personnel over Monday. Tuesday, General Wilson spent the morning looking over the construction. Wednesday, Mr. Tessman presided at a meeting to acquaint the Corps and Leavell-Kiewitt personnel with S-II Test Stand requirements. MSU officials were in to see about setting up technician training with Junior Colleges. Thursday, Art Sanderson came by to review personnel planning and site status. Searcy Smith and Jim Spearance looked into our audit needs with General Electric. Friday, Jerry Hlass from Headquarters wanted up-to-date briefing on progress of construction and how stage and support contractors will operate the various facilities to guide Bill Lilly's budget presentation to Congress, 17 Feb. Monday, we expect the special Washington group. It takes a good bit of time showing all these people around; we are drafting a request for moderation in visits but don't want to curtail essential ones.

2. County Roads: NASA Headquarters and Chief of Engineers Office agreed to try once more to reach understanding with Board of Supervisors. Monday a.m. Walter Mussell, Head of Mobile Real Estate Division, will ask the Board for more information on their proposed road improvements, current conditions, cost data if progress payments can be made, etc. Ed Ling will be in my office waiting to hear results. NASA may have to weigh a determination of necessity for replacement if Corps feels they legally cannot.

3. Labor Situation: The President's Missile Sites Labor Commission has ruled that Harder's, Inc. is a member of the National Electrical Contractors' Association and must pay the wage scale set by the Association to the electrical workers on the Laboratory and Engineering Building. The NECA wage scale for electrical workers is some 17 ¢ an hour above that which Harder's is paying.

BF

Please send me a 1-page explanation on the background of this hassle about the county roads (What's the bone of contention?)

B

NOTES 2/10/64 GEISSLER B 2/12

1. Q-Ball Measurements on Saturn Flights: Dr. Mueller requested through the Panel Review Board a re-evaluation of our Q-Ball requirements on Saturn I, IB and V. We had justified these requirements on Saturn I flights before. The angle of attack measurement belongs to the most important basic parameters of each R&D flight evaluation. The lack of this measurement was badly felt in one of the early Mercury-Atlas flights. We are trying to replace the Q-Ball by a fin-mounted sensor but need to calibrate both types simultaneously in several flights. Elimination of the Saturn I Q-Balls would exterminate this whole program. In addition to their value for flight evaluation, angle of attack measurements will probably be required for the Saturn IB and V Emergency Detection Systems. A coordinated R&DO position paper is being prepared. We are also concerned about the more fundamental implications of Dr. Mueller's continued and piecemeal requests to eliminate flight instrumentation (e.g. tracking beacons, tape recorder, altimeter, horizon sensor). It is very difficult to justify any single measurement on its own virtue. It is the MSFC philosophy of redundant instrumentation which is increasingly under attack although, in the long run, it may mean the difference between success and failure of our programs. It is considered very important to organize an effective and united MSFC defense for our measuring programs. Agree

2. Impulse Base Flow Facility: Our Impulse Base Flow Facility may now be considered operational. The results of Saturn 1 base heating tests at Huntsville compare nicely with earlier results from Cornell. The larger dump tank at Huntsville affords slightly longer running times. Some follow-on S-11 base heating tests may be conducted here soon because it is believed that the useful running time for the configuration was somewhat marginal at Cornell. For approximately another year, however, it is planned to use the Huntsville Facility not so much for routine data production as for methods research and refinement as well as further improvement of the in-house capability. The emphasis on methods research and refinement is justified by a number of, as yet, not satisfactorily resolved secondary problems such as accurate control of the O/F ratio, combustion and flow instability, combustion geometry optimization for design purposes, etc.

3. CCSD Aeroballistics Quarterly Review Meeting: The second subject technical review of the Aero-Astrodynamics Laboratory support contract was held Feb. 5 in New Orleans. Chrysler is continuing to develop design analysis capability. Previous technical assignments are progressing fairly smoothly. Recently, we assigned them a task in the area of meteorology and soon we will assign them tasks in the areas of unsteady aerodynamics and acoustics. Build-up of their Aeroballistics Section will continue to prepare them for accepting greater responsibilities and developing a systems capability. However, in view of their difficulty in hiring qualified technical personnel in the area of flight mechanics, they are still lagging behind our original plan calling for 80 people by 4th quarter FY64. The addition of 35 persons in the Flight Mechanics area beyond this number, according to the recent Newby Study plan, appears not to be feasible in the foreseeable future.

PUSH
Lee Jauco
positive during 1 agree 100%. Please defend our entire
12 Feb Program Review Briefing

Fw 2/10

NOTES 2-10-64 GRAU B 2/12

1. SATURN, SA-6: Post-static checkout of the S-I-6 stage was completed and the stage released to Manufacturing Engineering Laboratory on February 1, 1964. Final checkout of the S-IU-6 Instrument Unit has been completed. The Unit was released to Manufacturing Engineering Laboratory January 27, 1964. Simulated Flight Test of S-IV-6 will begin today at DAC, Sacramento. The pre-shipment turnover meeting on this stage is scheduled for February 17, 1964 at Sacramento. ✓

2. S-IV-7 CHECKOUT AT DAC, SANTA MONICA: Post-manufacturing checkout of the S-IV-7 stage has been completed at DAC, Santa Monica, and the stage is scheduled for shipment to Sacramento later this week. ✓

3. S-I-9 PRE-STATIC CHECKOUT: Pressure and functional checkout of the S-I-9 stage continues in the pressure cell of building 4705. Checkout completion and release to Manufacturing Engineering Laboratory is scheduled for February 11, 1964. ✓

4. QUALITY, RELIABILITY AND ACCEPTANCE TESTING REPORT: An analysis of qualification and reliability testing in all major Saturn V contracts has been prepared by this Laboratory for distribution to Project Directors, Stage, Engine and Instrument Unit Managers and other effected individuals. The report compares the various test programs with one another and with the MSFC test requirements, and provides recommendations to alleviate deficiencies apparent in the programs. Expeditious implementation of the recommendations has been requested of the Project Directors in that maximum impact can be realized while the test programs are in the formative stage. Subsequent analyses will be provided as more detailed information becomes available to this Laboratory. ✓

*5. NAA, DAC, QUALITY AND RELIABILITY ASSURANCE SURVEY: A quality and reliability assurance survey was performed at North American Aviation and Douglas Aircraft Company, Air Force Plant No. 3, Tulsa, Oklahoma, during the dates January 13 through January 23, 1964. The survey revealed that NAA has a satisfactory quality assurance program considering present program implementation and present potential to immediately comply with total quality requirements. It was determined that DAC does not presently have a satisfactory quality assurance program. The principal areas of nonconformance to quality requirements are the absence of an acceptable quality program plan, a shortage of quality assurance personnel to implement necessary program requirements, and inadequate inspection and calibration facilities. ✓

Bob Young Haus Mays FYI B

6. LABORATORY REPORTING REQUIREMENTS: Requirements for reports and special exercises regarding procurements, manpower, facilities, and budgets have increased drastically in the past few months. Usually, the requirement is based on a tight suspense date and the lead time plus the volume of work requires the Laboratory to commit resources at the expense of program execution. This becomes increasingly alarming as we approach the close of the fiscal year since it is then that we need to provide our quickest reaction to program needs. I realize some of these special requests are mandatory; however, some I question. There is a need for an awareness program at all management levels to assure that such requests are restricted to only those which are essential.

Tw 2/10

B 2/12

NOTES 2-10-64 GRUENE

Negative report.

NOTES 2/10/64 HAEUSSERM...

B 2/12

1. PERSHING SYSTEM PATENTS: We have been contacted a number of times by the AMC Legal Office concerning the Army's interest in establishing patents of components and techniques considered peculiar to the Pershing system. Apparently, it is the opinion of the Army that there exists, in fact, a number of patentable components and techniques. All records have long since been transferred to AMC's Guidance & Control Laboratory, and a number of our Pershing personnel stayed with the project when it was phased over to the Army. In view of this status, we propose to take the following action in response to the Army's request:

W.H. But let's not waste too much top talent time on this! B

a. In conjunction with the Army's G&C Lab personnel, identify a limited number of components and techniques which merit consideration for patent.

b. Support the Army's efforts in this area in terms of having key personnel in the respective areas participate in the preparation of required documentation.

2. EBW DESTRUCT SYSTEM: The EBW destruct system controller associated with the EBW firing unit that allegedly failed on the S-IV-5 during pre-launch checkout at the Cape was given a detailed evaluation test. There were no discrepancies noted and the controller was found to be in perfect operating condition.

3. DR. HALLER'S VISIT 2/19/64: For Dr. Haller's visit on 2/19, I need your suggestions for participation at the dinner. I would like to suggest at least the following guests from MSFC:

WH.

Dr. and Mrs. Rees
Mr. and Mrs. Gorman
Mr. and Mrs. Weidner
Dr. and Mrs. McCall
Dr. and Mrs. Stuhlinger
Mr. R. Young

} Fine with me. I cannot attend B

Tw 2/10

B 2/12

NOTES 2/10/64 HEIMBURG

*Tw 1. F-1 ENGINE TESTING (STATIC TEST TOWER WEST):

A test was conducted on 2/7 for a duration of 121.8 seconds (mainstage). Fuel pump inlet pressure was decreased approximately 2.5 p.s.i.g. to 23.5 p.s.i.g. for mainstage operation. All thermocouples were lost in the gas generator. The temperature spike measured in the turbine manifold was 2,470°F. A series of short tests will be conducted varying gas generator lox injector purge in an attempt to eliminate the temperature spikes in the gas generator. These tests will probably be run on 2/12 or 2/13. ✓

2. COMPONENT TEST FACILITY INCIDENT:

During the initial checkout test of the F-1 heat exchanger test facility, an incident occurred which resulted in damage to the facility. The gas generator thrust mounting failed after approximately 0.7 second of operation, which resulted in damage to the lox and fuel ball valves and subsequent release of a combustible mixture around the gas generator. Ignition apparently occurred from a powerful light on the test stand. Observer cutoff was initiated at 1.2 seconds, after which the fire went out with no further damage. ✓

The damage to the facility was limited to the gas generator, exhaust system bellows, and support brackets. The gas generator thrust mount and related equipment are being redesigned to prevent the recurrence of this "design goof" in the future. ✓

This incident will have no adverse effect on the F-1 engine test program and schedule. Our inhouse testing of the F-1 heat exchanger will be delayed until approximately mid-March to permit modification of the test facility as required. ✓

3. FLOX PROGRAM:

Conferences have been held with NASA Headquarters personnel to discuss their proposed flox program. A meeting is scheduled for 2/11 with NASA-Lewis and NASA Headquarters to discuss further the facility requirements for this program. ✓

As a result of your conversation with Gen. Zierdt, a meeting was held on 2/7 with AMC Safety Office personnel to discuss the safety considerations related to the use of flox. No decision was made by the AMC personnel regarding the feasibility of testing with flox. Mr. Tom Davidson, AMC Safety Office, has been designated as our liaison contact by Gen. Zierdt. ✓

4. MARINE TRANSPORTATION:

The last barge trip (SA-6) under Test Laboratory's jurisdiction, from MSFC to the Cape, started at 4 p.m. on 2/7. Fron now on, operation of the barge will be under the jurisdiction of the Project Logistics Office. ✓

KH. Test deserves a big pat on the back for setting up and running a very efficient transportation system all these years! B (Please pass this on)

NOTES 2-10-64 HOELZER

B 2/12

GE CONTRACT: As you know, we have competed our in-house technical support presently being performed by the General Electric Company. Only two companies responded to the RFQ - GE and CEIR. The proposals were evaluated by the Source Evaluation Board and a presentation of the findings was made in Washington last Thursday to George Lowe, in the Office of Manned Space Flight, and on Friday to Mr. Webb, Dr. Dryden, and Dr. Seamans. The presentation went very well and we expect the final selection to be made today.

Fw 4/10

B 2/12

NOTES 2-10-64 JAMES

*Fw SATURN I - SA-6-S-1-6 and IU-6 were shipped to Kennedy Space Center on February 7 and will arrive approximately February 18. It is currently estimated that S-IV-6 will be delivered to Kennedy Space Center on February 22, four days earlier than planned.

*Fw S-I Stage - Scope of Work was forwarded to Chrysler last week for modification of SA-D5 to S-IB Dynamics and Facilities Stage.
The next Chrysler Quarterly Review is tentatively scheduled for March 3 and 4.
The S-I-9 Stage is scheduled to go to TEST for start of static firing operations on February 17. Replacement of CRES tubing assemblies on S-I-8 were completed on February 5. S-I-8 will be shipped to MSFC on April 18 for start of static test operations.

*Fw S-IV Stage - Results of Cold Helium Testing - As a result of the completed helium bottle testing, DAC and MSFC have agreed to the following for S-IV-6 and subs: 1. Check adjustment and strap tension with a tensiometer, instead of a torque wrench; 2. Inspect: a. Hook dimensions; b. Strap dimensions; c. Hook and strap alignment. This work will be done at Sacto and will not delay S-IV-6. If inspection reveals deficiencies, they will be corrected by adjustments or new straps. In addition, the use of a uniball on the hook attachment will be incorporated on S-IV-7 and subs. DAC has been directed to stop all S-IV effort on the Helium Sphere Installation backup "basket design".

*Fw S-IVB Hydrostatic Stage - The forward LH_2 dome built for the dynamics stage was installed in the assembly tower for fitting operations to the LH_2 tank/LOX tank assembly of the hydrostatic stage. A "can" was formed in the dome during the fitting operation. DAC is attempting to work the "can" out, and if successful, the area will be X-rayed and possibly dye-checked for defects. Results of corrective action will be known this week.
Dynamics Test Stage - The former hydrostatic stage forward LH_2 dome is in rejected status. DAC has ground out the weld repair area to a skin thickness of .082 inches and eliminated the crack. Plans are in process to conduct tensile tests on specimens simulating the repair area. If results of the tests indicate the strength of materials, at .082 inches, can withstand design requirements, the dome will be used "as is" on the dynamics stage. However, if the tests fail, then an acceptable repair procedure will be agreed upon by NASA and DAC.

NOTES 2-10-64 Koelle

B 2/12

1. NASA POLICY COUNCIL: Last Thursday I gave an informal presentation to the policy council on the subject of reusable launch vehicles. In attendance were: Dr. Floyd Thompson (Chairman), Admiral Boone, Dr. Bisplinghoff, Mr. Fleming, Mr. Gray, Dr. Morrison and Dr. Marvin Schuldenfrei (Secretary). I presented the case of two-stage rocketplanes, which, according to our studies, shows a lot of promise as a passenger transport for orbital and global markets, and which is also quite useful for research and military missions. I have the impression that my presentation was received positively. The policy council is charged with the development of a NASA position on whether or not a hypersonic airbreathing research airplane should be built.

2. FUTURE OF NUCLEAR PROPULSION: Last Thursday, I had a 3-hour discussion with Harry Finger, Mr. Klein (his dupty), Carl Schwenk and Paul Johnson on the future of solid-core reactors. Will Jordan from P&VE participated. Harry Finger wanted to know, primarily, what mission market for nuclear propulsion we can foresee on the basis of our mission studies at this time. You might remember that the old NERVA specs resulted in a flight system which showed very little promise for applications. We concluded at the end of the meeting that a 200 to 300K thrust level is a more desirable objective and the late 1970's the most likely date for initial operational availability. Mr. Finger feels that he will have a good chance in 1968/69 to let an engine development contract on such an engine. In spite of this time table, there is a need to freeze the core diameter in the next few months, to get the facilities ready. We will continue to keep close contact with his office and do our best to develop a "market" for his program.

3. PLANETARY MISSIONS SYMPOSIUM: Here are some statistics on who attended our symposium on Manned Planetary Missions:

ORGANIZATION		NO. ATTENDED	
Space Council			1
NASA			
MSFC		77	
Headquarters		22	
Ames		2	
Goddard		2	
JPL		2	
Langley		3	
MSC		13	
	NASA Total	131	131
Contractors	(35 companies)		202
	TOTAL		334

These figures are based on our registration list.

FOR INTERNAL USE ONLY

Fw 2/10

B 2/12

NOTES 2-10-64 KUERS

1. Saturn V, S-IC Stage:

a. After a standstill of several weeks in some major areas of container manufacturing for the T-vehicle, we are now making progress again. The bonding of the fuel exclusion riser in the lower bulkhead is proceeding satisfactory and will be completed this week. Preparations for welding the upper fuel bulkhead to the skin section are under way. Since now the Meridian Weld Station is becoming a temporary bottleneck we are setting up a third shift for welding operations. ✓

b. A strike broke out at Arrowhead on February 1. A federal mediator has been called in and meetings are being held to try to resolve the points of disagreement. Work on S-IC-T hardware is being performed by supervisory personnel and it is too early to predict any direct results of this strike at this time. ✓

c. Two major tools for S-IC fabrication were received last week: (1) The forward handling ring for lifting and tilting the complete stage from the forward end. This tool was designed here and built and tested by Boeing, Michoud. (2) A 50 ton "Dortech" mobile flat bed, needed for switching operations of complete containers between stations in vertical assembly tower. ✓

2. Saturn V, S-II Stage: NAA completed fabrication of first bulkhead (aft common dome) on February 5. ✓

3. Future Experimental In-House Projects: OART, M.B. Ames, DeMeritte, and M. Roscher will support in FY-65 the continuation of the Configuration Research Program and fund a large scale experimental tapered multicell tank. They will further fund wind tunnel models for "Integral Tank Wing" configuration and support NASA Flight Research Center in Edwards in free flight models for first stage recovery. Paul Bikle, Director of NASA Edwards, came here after discussion he had last week in Headquarters, for a preliminary information meeting with Messrs. Wuenscher and Blumerich. He mentioned that in connection with the M2 (Flying Bathtub) Program, his Center could care for design, manufacturing, if wanted, and flight testing of a free flight model of a C1 center body up to full scale, and 50,000 lbs weight in B52 drop testing. He said OART would finance that, if Marshall wants it. Program at Edwards could start in 1 year from now or later.

Hermann Steidner

Please look into this and advise me whether or not you feel it is worthwhile for MSFC to support such a plan, on top of all our other problems

B

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B 2/12

NOTES 2-10-64 MAUS

1. PROGRAM INTEGRATION - The first MSFC submission for the NASA-wide Program Obligation Plan for Research and Development Projects was transmitted to MSF on February 7, 1964. It contained separate volumes for MSF, AR&T, SS&A, OTDA, and TU&PP. Appropriate copies were sent to responsible Program Offices. This submission constitutes a preliminary statement of FY 1966 Requirements which show only a slight increase over the FY 1965 requirements. It was noted in the submission that the R&D requirements were based on receiving the required amounts for Administrative Operations and Construction of Facilities. ✓

   We have not yet received either the budget calls nor the Headquarters guidelines for Administrative Operations and C of F budgets. ✓

2. MANAGEMENT SYSTEMS REVIEW COMMITTEE - The new Program Execution Procedure has been approved by Mr. Gorman and published. It covers planning, receipt, distribution, and execution of Program Authority. ✓

   We will give a brief explanation of this procedure at the next combined Staff and Board Meeting. ✓

   Efforts are continuing toward completion of the ANOPPA (Advanced Notice of Proposed Procurement Action) and the mechanized Procurement Status Reporting System. ✓

3. PROGRAM SCHEDULING AND REVIEW PROCEDURE - Tom Smith will represent Marshall at the Feb. 12-13 meeting of the Standing Committee on Scheduling and Review Procedures. As we did in January, we will have the latest information and status report available for you in your briefing folder for the February Program Management Council Meeting. ✓

4. INSTITUTIONAL PRESENTATION FOR FEBRUARY PROGRAM MANAGEMENT COUNCIL MEETING - We are preparing the institutional portion of the MSF Program Review to be given by Dr. Rees on February 18. We will have this ready for the internal Management Review (dry run) on February 13. ✓

fw 2/10

NOTES 2-10-64 McCartney B 2/12

1. MANPOWER: On February 3, R&D Operations received 100 civil service spaces. These represent the first increment of our portion of Marshall's 370 new spaces. We have distributed vouchers allocating the 100 spaces to our laboratories and offices. ✓

2. YEAR-END UNENCUMBERED FUNDS STUDY:

a. My Notes of February 3 estimated a total for Saturn V of about $44M, which might not have costs accrued by June 30. Of that amount, $21M was transferred to Industrial Operations in the January 10 POP, as reported last week. ✓

We are now conferring with Financial Management Office to place about $22M in "blocked" accounts. The laboratories will be able to process purchase requests against the "blocked" accounts, with the concurrence of Mr. Bush of my Budget and Contracts Office. By the end of February, we expect to learn whether or not Industrial Operations will require the transfer to them of any part of our $22M in the "blocked" accounts. ✓

b. Investigations to date indicate that, for Saturn I/IB, there is a total of about $12M against which the laboratories will not be able to accrue cost by June 30. After further discussion with the laboratories, the correct amount of anticipated unencumbered funds will be treated as described above for Saturn V funds. ✓

3. PROGRAM EXECUTION PLAN: In the absence of a formal program execution plan to use as a pattern, we, in concert with Industrial Operations, have agreed on the subjects which should comprise such a plan. ME and P&VE are preparing samples indicating the narrative content of a proposed program execution plan. These samples will be used in readying ourselves for the FY-65 program. ✓

B 2/12

NOTES 2-10-64 MRAZEK

1. RIFT TERMINATION: Dr. Bisplinghoff's reply to teletype of 1-20-64 essentially approves the expenditure of the funds remaining in the RIFT contract, NAS8-5600, provided that the funds are transferred to a new contract and the RIFT contract canceled. Mr. Buckner (PR-CH) is implementing the new contract (NAS8-9500) simultaneously with the termination of the RIFT contract to insure continuity of the Lockheed effort in the current tasks. The term of the initial contract will be through 8-31-64. A source of funds for continuation beyond that time has not been identified.

2. S-II STAGE PROCESS SPECIFICATIONS: A crash program to review and coordinate North American Aviation, Inc. (NAA) Process Specifications began 2-3-64. The Industrial Operations S-II Stage Manager stated in the kickoff meeting that S-II hardware is being held up due to unapproved process specifications. An all-out effort is being made by MSFC Laboratories to have the outstanding process specifications approved. Preliminary reviews of 64 of 197 NAA documents on hand have been completed. A cordinated compromise approach of process specification policy and procedure has been written (Memorandum No. R-P&VE-VN-63-14). This approach is our recommended solution to the process specification problem.

3. S-IV ALL-SYSTEMS TEST BLAST EVALUATION COMMITTEE: The full committee began official operations 2-5-64 at Douglas Aircraft Company, Sacramento, California. Two consultants, a blast structural damage expert from the Army Ballistic Research Laboratory (Maryland), and an Air Force aerospace expert on missile and space vehicle blasts also are being used. The site has been thoroughly inspected for structural damage, shrapnel weight and distribution, glass breakage, etc. The committee now is evaluating these findings. Disposition of the blast gages furnished previously by MSFC also is being investigated.

4. S-II 2-GPM AUXILIARY PUMP MOTOR MARGINAL: Servo-valve leakage will consume 1.8 gpm leaving only 0.2 gpm for accumulator charging and checkout. As servo-valve leakage increases, the pump will become inadequate. Alternative designs are being considered. The use of a fan-cooled motor (similar to S-I) may be possible because there is a nitrogen atmosphere in the S-II interstage during launch preparations.

NOTES 2/10/64 RUDOLPH B 2/12

1. Saturn V Budgetary Requirements - Saturn V preliminary budgetary requirements for supporting the official schedule "J_1" have been determined to be as follows:

FY 64	Currently Authorized	$ 681.1 M
	Supplement Requested	110.0 M
	Total	$ 791.1 M
FY 65	Basic Requirements	$ 921.7 M
	Back-up Programs	41.0 M
	Total	$ 962.7 M
FY 66	Basic Requirements	$1,060.5 M
	Back-up Programs	50.0 M
	Total	$1,110.5 M

2. S-IC Stage:

MTO Activation - The Boeing proposal for activation of MTO, reported on in last week's notes (2/3/64 Rudolph), is for design, manufacture, and installation of test and checkout equipment for the S-IC acceptance test stand.

Telemetry - Qualification of telemetry components designed and developed by MSFC will be assumed by Astrionics Laboratory. A Change Order is being requested to delete this work from the Boeing Contract.

3. S-II Stage:

Propellant Utilization (P.U.) System - (Reference notes 2/3/64 Rudolph) The additional justification data from S&ID regarding their proposal to delete the P.U. System has been provided. A request has been made to R&DO for a final technical position by 2/12/64. The Contracts Office has suspended action on approval of the DAC sub-contract until a firm decision is made to either retain or delete this item.

Automatic Checkout Equipment - Initial 100% design release has been accomplished by S&ID on the automatic checkout equipment. The final Phase I control drawings for this equipment are being submitted to MSFC for review and approval.

4. S-IVB Stage - (See James' Notes)

5. Instrument Unit:

Structural Test - Late delivery of the Apollo adapter section is expected to delay the structural test program. Impact is being investigated.

Flight Systems Test Unit - The schedule for vacuum chamber testing of the flight systems test I.U. (S-IU-500FS) must be slipped due to late delivery of ST-124 platform, advanced guidance computer, and data adapter. Impact is being investigated.

Tw 4/10

B 2/12

NOTES-2-10-64-SHEPHERD

No Notes

B2/12

NOTES 2-10-64 Stuhlinger

1. MMC AND SA-5 TUMBLE PROBLEM: A quick look analysis of the SA-5 flight data indicates essentially no residual yaw, pitch, or roll rates for 170 seconds after S-IV cut-off. Subsequent data received on the first orbit indicated an attitude motion with a rate somewhere between 4 and 18 deg/sec. The MMC Project Office is initiating a rigorous evaluation of the structure of the SA-9 payload to determine the maximum angular rates and accelerations which it will withstand and still continue to function properly.

The MMP office is working with the Vehicle Systems Division, P&VE Laboratory, investigating the feasibility of designing the S-IV LOX and LH_2 venting systems to insure no residual thrust about the orbiting payload center of mass.

2. FUNDING OF OMSF - SRT PROGRAM FOR FY-64: Funds for the FY-64 SRT program, which was approved by Dr. Mueller on January 16, were finally authorized by OMSF on February 6. FMO is now processing procurement requests to P&C with authority to obligate.

3. SA-10 PAYLOAD: A list of 36 proposed experiments for the SA-10 payload was discussed between OART and members of all the Centers (even the Air Force) in a two-day meeting. This list is now being reduced to a hard core of experiments by OART and RPL. Dr. Bisplinghoff desires to arrive at a firm project as soon as possible. Dr. Mueller wishes to bring the SA-10 project before the new MSF Experiment Board on February 11. Milton Ames, who will represent Dr. Bisplinghoff in this meeting, asked me to support him with technical material in the meeting.

4. ALSS PAYLOADS: In compliance with a request by Mr. deFries, RPL has prepared a preliminary mission operational plan for a two-week mission on the lunar surface with a two-man roving vehicle. The plan is being documented in an Internal Note which will be published soon. This work serves to establish an overall framework of a two-week mission on the lunar surface. Future iteration and refinement of the ALSS mission operational plan(s) will be handled directly by Mr. deFries' office. RPL will now concentrate on the scientific aspects of the mission, i.e., defining the scientific instrumentation and associated equipment and the experimental procedures in more detail.

5. ELECTRIC PROPULSION STUDY CONTRACTS: This Laboratory was asked last fall by Mr. I. R. Schwartz, OART, Office of Nuclear Systems, to assume technical supervision of electric propulsion tasks. Two tasks in the systems studies area have been committed: "Study of Electrically Propelled Cargo Vehicle for Sustained Lunar Supply Operations" and "Analysis of Electric Propulsion Electrical Power Conditioning Component Technology." A third task, involving a manned Mars vehicle, was initiated recently by FPO. It will be supervised jointly by FPO and RPL.

FEBRUARY 17, 1964

OFFICE OF DIRECTOR – MSFC

CODE	NAME	INIT.	☐ ACTION	☑ INFORMATION
D&P-A	Mr. Borman	✓		

REMARKS

CODE	NAME	DATE
DIR	F. Williams	5/24/64

MSFC - Form 495 (Rev August 1963)

NOTES TO MUELLER 2-18-64 DEBUS

1. SA-6: The S-I arrival at KSC was advanced by three days and S-I and S-IV mating has been delayed three days to accommodate time to enter and inspect both the LOX and Hydrogen tanks of the S-IV-6. (The S-I stage arrived at KSC on Tuesday night, 18 February, and was taken to the pad 19 February, one day behind proposed plan because of inclement weather.) The forecast launch date is the middle of May. Spacecraft operations were also re-evaluated, and it appears that BP-13 will mate with the launch vehicle very shortly after IU final erection, allowing MSC-FO personnel plenty of time to checkout and verify their Complex 37 GSE prior to being required for composite SA-6 space vehicle systems tests.

2. FEC Problem Summary: As a result of the finalization of the agreement between NASA and FEC for the operation of the spur line, pickets were placed by railroad unions at all entrances to MILA and Cape Kennedy on February 10 and 11 causing approximately 4, 500 construction and industrial workers to leave or not report for work on each of the two days. Picketing began at 6 a. m. on the 10th prior to the first train to use the Government portion of the spur following the finalization which crossed at approximately 8:30 a. m. Pickets were removed as of 6 a. m., February 12, as a result of the National Labor Relations Board obtaining a temporary restraining order signed by Judge Young, Federal District Court, Orlando, Florida.

3. National Labor Relations Board: An attorney from the NLRB Injunction Section, Washington, D. C., headed a team of five field representatives that investigated charges filed by contractors and obtained a temporary restraining order issued by Judge Young of the U. S. District Court for the Middle District of Florida, Orlando, Division. A hearing scheduled before the Judge for 2 p. m. February 13 was postponed by informal agreement between the NLRB representatives and the local unions. (It is not clear how the NLRB would be able to take jurisdiction of the matter, but this course at least absorbs some time (perhaps as much as 20 to 30 days) all of which may be used in resolving the issue through some other approach).

Secretary Wirtz' Missile Sites Commission met later and informal feedback from the Executive Session indicates that the Missile Sites Commission has decided on four steps:

1. They will take over jurisdiction of that portion of the strike that affects Cape Kennedy and MILA.

2. They will instruct the Railroad Brotherhoods Union not to picket within this area.

3. They will instruct the Building Trades and Crafts Unions to remain at work and not to honor any picket line in this area.

4. They will try to solve the problem on a more permanent basis. An expressed opinion of our Industrial Relations personnel is that these steps will probably assure us no resumption of pickets for thirty to sixty days.

4. VAB - Erection of Structural Steel: Practically no work accomplished in the past week due to inclement weather and strike.

5. An "Executive Salary Committee" has been established at KSC, consisting of prime staff members with myself as Chairman to review all candidates' qualifications for advancement to, or placement at the GS-14/15 level of the KSC organization. PURPOSE: To evaluate each candidate's qualifications for technical as well as managerial ability to fulfill the responsibilities in these positions and to see that criteria are maintained throughout the Center.

6. SACTO All Systems Vehicle - Ad Hoc Committee Report: will be delayed for additional time required to evaluate an apparent discrepancy in the data. Incidentally, preliminary calculations made by Ballistic Research Laboratories, Aberdeen Proving Ground, Maryland, tend to confirm approximations previously made regarding "TNT" yield. Approximations of damage to stand indicate "close in" damage equivalent to 150-300 pounds (0.3%) and midfield damage approximating 1%.

7. Launch Facilities Study: An extension (from February 20, 1964 to April 16, 1964) of the current contract "Post-Saturn (formerly NOVA) Launch Facilities Study" with Martin-Marietta Corporation, Denver, Colorado, is being negotiated by the Purchasing Office at no cost to the Government. The supplemental agreement should be in effect before expiration of the current contract. Extension was necessary due to delay in approval of 1964 Advanced Study Funds. Advance unofficial word from John Stone, NASA Headquarters is that $300,000 was approved on Feb. 7, 1964, for continuation of 1964 launch facilities studies. Work statement for next phase of work will be prepared after coordination with MSFC is complete about the end of February 1964.

8. Interim Operation and Maintenance of MILA Utility Systems: Upon request by NASA, the Corps of Engineers procured services for interim operation of utilities. A supplemental agreement to an existing construction contract was issued to Bucon, Inc. This resulted in Bucon employing

building trades personnel in lieu of machinist union personnel on an operation and maintenance effort. In order to avert a possible labor dispute, NASA Contract NAS10-1223 was issued on February 8th. Machinist Union workers will be employed under the new contract. No labor difficulties are anticipated. The new contract will be in effect until such time as the Base Support Services contract becomes effective.

9. GSA Interagency Motor Pool at KSC: The determination issued by GSA to operate an interagency motor pool at this Center will be effective March 9, 1964. Proposed date to begin operations is April 1, 1964. GSA has advised that they will assume the existing vehicle lease contracts with MSI if determined by KSC to be in the best interest of the Government. They also will retain the majority of personnel as Civil Service employees. Spaces are available to GSA for this purpose.

KSC will initially be served from the current motor pool area. A subpool at the Canaveral District Engineer's Office will serve other Governmental activities who do not have access to the Industrial Area, KSC.

10. Digital Command Equipment for SA-6: The digital command test equipment to be used at Ascension Island on SA-6 has been received at KSC. Necessary arrangements for transfer to Ascension have been completed. This is a vital element in the flight safety as of SA-5. I have established a committee of MSFC/KSC/AFMTC personnel to explore actively what can be done to accelerate the operational readiness of this system so that it can be used for flight safety.

11. Cost Quotation (Calibration Study): The General Electric CPPF Cost Quotation in the amount of $282,109.00 for engineering support to the MSC Florida Operations for the Calibration Study was submitted by this office to the KSC Contracting Officer for appropriate action. The purpose of this Task is to determine the Instrumentation Calibration Plan which can be implemented within the framework of the present day Manned Spacecraft philosophy.

12. Cost Estimate (Support of Launch Operations Division, KSC): General Electric's Cost Estimate for support of the Launch Operations Division, KSC to the KSC Contracting Officer for review and evaluation. Total CPFF price is $1,062,022.00 providing for 341 man months of engineering services during the contract year ending September 30, 1964.

13. PACE-S/C Program: The MSC Contracting Officer has advised General Electric through this office that Dr. R. W. Lanzkron is the only individual authorized to provide Direction of Effort for the PACE-S/C

Project pursuant to Article VI of Contract NASw-410, and that in no event will such authority be construed as authorizing Dr. Lanzkron to increase or decrease the terms, conditions, or scope of the contract. Subsequent to the above, Dr. Lanzkron has agreed with Mr. Preston that day-to-day technical direction is, and will continue to be, the responsibility of MSC Florida Operations and the General Electric Company was informed of this. Dr. Lanzkron will issue this understanding in writing.

14. Recruitment: Miss Smith, GS-3 Clerk-Typist, is the seventh Negro employee currently on our rolls. Of the seven, four have permanent appointments and three have temporary appointments.

NOTES 2-17-64 BELEW

B 2/22

RL10 ENGINE PROGRAM

Work has been initiated to determine feasibility of reducing engine NPSH to a point where boost pumps on the Centaur stage could be eliminated, if this measure is required. It is expected that testing in support of this effort will start on E-5 test stand in the near future. A plan of action has been formulated for an incentive contract for the RL10 production contract. Negotiations should start prior to the first week in June 1964. This is in keeping with our meeting set up by Harry Gorman with MSF (Bothmer) a couple months ago.

H-1 ENGINE PROGRAM

In answer to your question "H-1 stability" on my Notes 2-10-64 -- During 110 tests of five H-1 engines at thrust levels above 204K, 13 bursts of combustion instability occurred (two for H-112B, two for H-113B, eight for H-114B, and one for H-116B).

All 13 bursts damped including six instances with damp times less than 10 milliseconds. All injectors have been used for R&D limits tests including "Bombing with 50 grain charges" and also had accumulated greater than 1,400 seconds prior to the first burst of instability. This type injector-thrust chamber combination has in all cases recovered from bomb tests when the thrust level was below 220K.

Two theories which could cause this instability have been advanced: (1) carbon buildup on the injector face and thrust chamber walls becoming fuel soaked, flaking off, and simulating a small bomb as it passes into and through the flame front. (2) a leaking O-ring which separates the fuel injector manifold and thrust chamber combustion zone causing a disturbance at the injector face.

Rocketdyne is continuing to investigate these theories as well as other possible causes. Although this type instability is not considered to be a monumental problem in view of the recovery characteristics and no hardware damage of the low fuel Delta-P injector efforts are directed at complete elimination of this phenomenon.

J-2 ENGINE PROGRAM

The development and production programs continue to be hampered by the lack of hardware. Various manufacturing problems are preventing a smooth flow of components to the development test program and production final assembly. Action is in the mill at Rocketdyne relative to organizational changes that will give a long range improvement.

F-1 ENGINE PROGRAM

Testing of the H-1 Engine at Neosho, Missouri, for F-1 model engine combustion stability program has been completed. Various injector designs, without film coolant and with the outer two propellant rings plugged, were tested to evaluate the effect of bomb induced instability and Isp. Pending completion of data evaluation, Isp performance and recovery from instability appears good.

The second production engine, F-1002, in test at Edwards Air Force Base and will be delivered to Huntsville late in March.

GENERAL

Our engineering services contract spaces are to be withdrawn by March 31. Some BECO personnel now occupying these spaces may be converted to Civil Service and additional Civil Service personnel will ultimately be recruited to fill the remaining vacancies. This time consuming operation will disrupt internal procedures and substantially affect continuity and capability in such areas as SARP chart and presentations preparation.

Significant organization changes relative to our projects at Rocketdyne are forseen in the near future.

NOTES 2/17/64 CONSTAN

B 2/22

1. STATUS OF SA-8

Installation of all sleeves and tubing assemblies has been completed on S-I-8. However, there are 41 assemblies that have not been excepted yet. Functional checkout of S-I-8 began again on February 12 and is scheduled for completion March 13, 1964.

2. STATUS OF SA-10

On S-I-10 the 4 in-board engines are installed. The No. 1 out-board engine (5028) suffered damage consisting of dents in a number of the thrust chamber tubes inside and adjacent to the throat area. This damage resulted from contact with the press-ray beam. Preliminary investigation indicates the chamber will still be usable. Engines No. 1 and 2 have completed pressure check and hydraulic check; cable installation is in progress. Engine No. 3 is in pressure test. The lox and fuel containers for SA-10 has been completed except for modifications. Instrument compartments No. 1 and No. 2 are approximately 70% and 72% complete, respectively. The tail section is now approximately 65% complete. The 2nd stage adapter assembly is 92% complete. Flame shield is 55% complete. The replacement of tubing incorporating re-heat treated MC-125 stainless steel sleeves is now 45% complete.

FW 2/17

B 2/22

NOTES 2-17-64 DANNENBERG

1. Working Groups Updated Charter is being drafted jointly with lab directors and working group chairmen in preparation of a joint meeting with IO and you on this subject.

2. Flight Missions. - Progress has been made at Washington in developing new mission assignments. Bellcomm document has been modified to include Center inputs. Each Saturn IB L/V (201 to 212) will have an assigned and defined Apollo payload. Dual shots are not included at this time. Several more rounds of negotiations are anticipated before a fully developed mission document will be proposed. General Phillips will present interim report on Flight Missions in Management Council meeting.

3. NAA, S&ID and MSFC are reviewing NAA Process Specs submitted in accordance with contract provisions requiring MSFC approval. To date, nine of the most critical individual specifications submitted have been approved. This method of handling process specs was pointed out as a symptom of MSFC's basic Documentation Control problem. A plan was proposed at the R&D Council meeting 2-14-64 to study effect of existing standards and procedures on our increasing role as "Prime Contractor Systems Engineering Staff."

4. Dr. Yarymovych is developing a strong requirement for two-stage Saturn IB vehicles, 3 launches for CY 68 and a minimum of 5 launches for CY 69. Very much interest was expressed for 3-stage Saturn IB vehicles to obtain micrometeoroid data in the belt between Venus and Mars. OSS indicated their Voyager program has slipped to CY 71. Titan III C, Saturn V and Saturn IB are now being considered for this mission.

5. Mr. Fero, NASA Headquarters, stated that he planned to establish missions for 6 Saturn IB's per year if possible and staff a letter to AF asking for suggested additional missions to increase the capacity to 12 per year.

6. Draft copies of the Saturn brochures were shown to the MSF Saturn IB Marketing Task Team. Members of this task team are anxious to obtain copies of the brochures.

7. A letter from Milton Rosen to Mr. Flox, which provides the latest NASA position on the Titan III, Saturn IB controversy, has been furnished to Mr. Frank Williams.

HHKoelle
for info.
B 2/22

fw 2/17

B 2/22

NOTES 2-17-64 FORTUNE

1. Bell Com personnel Lovell, Bidgood and Wilhite were briefed by Henry Auter at MSFC Monday, then visited MTO Tuesday. Their interest was general, but Wednesday a Mr. Lou Miller from the Bell Com office in Washington called for further information on our Acoustic Program and Environmental Measurement Activities. He was referred to our meteorologist, Lee Nybo, and Dr. Sieber, Test Lab. ✓

2. County Roads are critical problem areas, because of Corps of Engineers discussions with Hancock County Supervisors and because they're breaking up under the heavy construction loads now being imposed on them. The County does not feel the Corps has been earnest and sincere in their dealings which was the reason they set up road blocks before. Now the Corps has given them the impression they will be reimbursed for roads not only in the Fee Area but in the Buffer Zone as well. Pearl River County Supervisors heard this and want the same. Costs could go to a million and a half dollars or more. There seems to be a misunderstanding between the Washington office, Corps of Engineers, and Mobile personnel which Paul Sembling, NASA Headquarters is trying to iron out. Ed Guilian and Ed Ling are keeping in touch and will let me know about attending another meeting this a.m. between the Supervisors and the Corps. I will report as you requested in notes of 2-10-64 after this meeting. Repairs or maintenance, mentioned before, may be also costly, preliminary estimates exceeding $50,000.00 for the Upper Gainesville road alone. Concrete trucks deliver their loads from the Batch Plant this route. ✓

3. Gov. Johnson and the Mississippi Agricultural Industrial Board seemed very pleased to hear of construction progress, and the money being spent in Hancock County. Thursday a.m. in Jackson, I talked for about half an hour at their first monthly session. Afterwards, several members remarked about my statement that equal employment opportunity was a fact of life at MTO and said it was time more people realized this, and they appreciated my neither apologizing nor blowing it up. ✓

BF

Gov. Bartlett's successor? Since when?

B

Fw 2/17

NOTES 2/17/64 GEISSLER B 2/22

1. Comments to "FPO Statistics" (item 2 Notes 1/27/64 Koelle): Copy of above note is attached as enclosure 1. We agree that the in-house engineering man-year cost of $29,650 reported by Dr. Koelle is realistic, and that the output per man-year for industry and government, in these "future project" studies, is about the same. However, in Aero-Astrodynamics, we have not experienced the decline in future projects effort noted by Dr. Koelle. ✓

2. SA-5 Orbital Attitude Rate: Attempts have been made to ascertain SA-5 orbital vehicle attitude rates. The only signal strength records so far available have been Green Mountain records. GSFC and AMR have been requested to forward all signal strength records, but they have not received any yet. Assessment of Green Mountain records through February 7th indicates a periodicity of approximately 120 sec after the first 48 hours of orbit. Periodicity assessment prior to this time is inconclusive. Number of optical observations (Baker Nunn and Moonwatch) reported through Feb. 9 totals 56. Of these, 48 made no comment on periodicity, 4 reported no detection of tumble, and 3 stations reported an optical period of approximately 65 sec (half tumble period). The information available at present indicates a periodicity of approximately 120-130 sec (3 deg/sec) which is assumed to be a tumble. No comments have been received which would indicate a roll of the orbital vehicle. ✓

3. Stability, Guidance, and Control Sub-committee of the NASA Design Criteria Steering Committee: It has been decided and agreed to by NASA Headquarters that s support for this sub-committee will be coordinated by us at Marshall, and will include the following areas: (1) Flight Evaluation, (2) Aerodynamics, (3) Flight Mechanics, Trajectory Optimization and Guidance, (4) Dynamic Analysis, and (5) Control. Our Mr. Baker attended an informal meeting in Washington on February 12, at which our tentative work statements were reviewed and approved by Mr. Rhode, the committee chairman, and Mr. Gillis the sub-committee chairman. Mr. Baker was told that funds to implement this assignment are being sent to Marshall ($325,000 FY 64 and $425,000 FY 65). We are preparing the RFQ's and plan to have them ready to send out when the funds arrive. ✓

4. MOLAB (Mobile Lunar Laboratory): Mr. de Fries returned from Washington with a letter from Mr. Gray informing us that 1.6 M$ are available for the planned design studies and that the money is being transferred to MSFC. ✓ This was expected as you know, and we are ready to issue the RFP's next week. There will be two contracts to pursue two distinctly different approaches. We are issuing the request for proposals next week. ✓

↑

HH. Koelle

for info B

NOTES 2-17-64 GRAU B 2/22

1. S-I-7 POST-STATIC CHECKOUT: S-I-7 stage tubing and engine cable replacement was completed and the stage released to this Laboratory February 14, 1964. Continuity checkout is presently in process in the pressure test cell of building 4705.

2. S-IU-7 CHECKOUT: The S-IU-7 Instrument Unit was released to this Laboratory February 12, 1964, and is presently undergoing pressure and functional test in the pressure test cell, building 4705.

3. S-I-9 PRE-STATIC CHECKOUT: Pre-static checkout of the S-I-9 stage was completed and the stage released to Manufacturing Engineering Laboratory February 12, 1964.

*4. FAILURE REPORTING: A meeting was held with Boeing, Michoud for the purpose of establishing a regulated and timely failure reporting system from Boeing to MSFC. This system will cover the reporting of failures and follow-up action from the time of final manufacturing checkout until launch at the Cape. It appears that very few problems are involved in establishing this system as Boeing has a good in-house failure reporting system from which the desired information can be programmed into the Unsatisfactory Condition Reporting Computer System of this Center. Boeing personnel appeared receptive to establishing this system and made a number of suggestions dealing with improving the methods of transmission of information. Douglas Aircraft Company has agreed to furnish failure reports for the S-IV program, and to submit a proposed failure reporting system for the S-IVB program by March 15, 1964. We are also meeting with representatives of Kennedy Space Center and Manned Spacecraft Center to discuss problems and to coordinate planning involving failure reporting for the Manned Space Flight Program.

*5. IBM QUALITY AND RELIABILITY SURVEY: A Quality and Reliability Survey was conducted at International Business Machine Corporation, Owego, New York during the week of January 27, 1964. This corporation has several contracts for guidance computers, data adaptors and guidance signal processors under the technical cognizance of Astrionics Laboratory. The end-item test plan was the only major document required which was not available; however, the documentation required to formulate the test plan was available. Minor deficiencies were found in procurement, handling of government furnished property and handling of inspection stamps. No major deficiencies were found.

*6. AIR FORCE INSPECTION SERVICES: Air Force participation in the subcontract area at Rocketdyne has been investigated and found to be inadequate. The Air Force does not properly redelegate government source inspection and does not monitor the government source inspection activity. Steps are being taken to improve this situation.

NOTES 2-17-64 GRUENE

1. SA-6 Schedule:

a. Request for inside inspection of the O-2 and H-2 tanks of S-IV-6 at the Cape will delay the pad erection of S-IV-6 slightly. If no discrepancies are found which require rework, our original schedule (end of May) can be kept.

b. MSC is well ahead of schedule with their spacecraft and should not cause any delay.

c. RF Interference: (Reference NOTES 2-3-64 GRUENE, copy attached.) We reached full agreement with Sendler and Hoberg, who in turn will directly get concurrence from Dr. Speer.

d. It will be of interest to you to know that we found, in addition to the cracked sleeves, some more cracked components (hold down arm blocks and separation assemblies) in the GSE possibly caused by similar heat treat problems. Dr. Lucas is on board. No schedule delay anticipated.

2. West Coast Visit: Some of my people and I will visit NAA and DAC on February 19-20 to investigate possible access problems by inspecting their mockups. P&VE will also be represented. Industrial Operations arranged the visit.

Attachment
NOTES 2-3-64 GRUENE

NOTES 2/17/64 HAEUSSERMANN

W.H. q-dependent, or constant torque? What's G. Mrazek's diagnosis? B

1. ROLL ATTITUDE ERROR ON SA-5: The error that occurred during first stage flight was caused by a roll torque of undetermined origin. Since steady-state roll engine deflections follow the ϕ roll profile, the existence of a large roll torque is definite. A moment of 10,000 kg - meters would be required to cause the 3 degrees of roll observed and this is several times larger than was noted on Block I flights. This moment is equivalent to 0.6 degree β.

2. FUEL CELLS: (Reference your comment to Item 2, Notes of 2/3, copy attached*) OART personnel have brought up the question concerning in-house capability in connection with several projects to find out whether we are able to supervise contractors based on experience of our own. To avoid losing certain present OART tasks later to ERC, we might do well to build up a modest in-house capability in such new areas as fuel cells.

3. CLOSED LOOP GUIDANCE SA-6: In view of the apparent correct operation of the guidance hardware on the SA-5 flight, we have decided with the support of Aero-Astrodynamics Laboratory to utilize closed loop guidance on SA-6 flight. The guidance loop would be closed for the S-IV portion of the flight in both cross range and pitch, and velocity cutoff will be implemented. The portions of the flight up to this point will utilize the same hardware as that used for the SA-5 flight.

* Copy of 2/3 Notes distributed to M-DIR and R-DIR only.

NOTES 2/17/64 HEIMBURG

B 2/22

*fw 1. F-1 Testing (Static Test Tower West):

Tests TWF-011, 012, and 013 were conducted on 2/13. Test 011 was aborted prior to thrust chamber ignition, due to the gas generator igniters break wire links closing momentarily after burn-through, thereby initiating the automatic links malfunction cut-off system. This is a random event, and changes are being incorporated to prevent this from happening in future tests. Test 012 was a sucessful 5-second mainstage run with the lox pump inlet pressure lowered 8 p.s.i. below the predicted S-IC start conditions. Test 013 was a successful 50-second mainstage run with the lox pump inlet pressure lowered an additional 10 p.s.i. Preliminary evaluation of data from these tests indicates that reducing the lox pump inlet pressure resulted in decreasing the turbine manifold temperature spike by approximately 1400°F to about 1100°F. The 1100°F is a relative temperature and should not be construed to be a "real" temperature. Also, these temperatures are based on only two F-1 tests, and statistical data cannot be established until additional tests are made. The next F-1 engine test is scheduled for 2/19.

2. S-IC-T Working Group:

Reference NOTES 2/3/64 KUERS (Copy attached). The promised status and problem briefing on S-IC-T will evolve from the meeting scheduled in your conference room at 9 a.m. on Wednesday, 2/19, in which P&VE and ME Labs and the Boeing Company will participate.

3. Flox Program:

Reference NOTES 1/27/64 GEISSLER (Copy attached). We are all well aware of the problems inherent with consideration of the use of flox at MSFC. However, we cannot understand the need for additional personnel for climatological determinations. With the termination of the RIFT program, we assume personnel from that project office will be made available for use on other programs. We envision utilizing the same personnel in Test Lab for the flox climatological work as are presently used for the acoustical environment work related to the sound suppressor and the F-1 engine tests. Any additional personnel requirements can be fulfilled by the use of contractor personnel.

KH. See McCall's letter on this subject. B Copy attached. RSH 2/22

4. MTF Working Group:

A pre-proposal conference with GE is scheduled on 2/19 for the Electronics, Instrumentation & Materials Lab Technical Systems. The EI&M Lab represents the initial procurement increment under Phase II and III MTF Technical Systems. Reference NOTES 11/26/63 HEIMBURG (Copy attached). The fund shortage of $3.075 M for completion of the Land Acquisition Program at MTF is being resolved. We have received $800,000 towards making up this shortage, and the balance is expected during March 1964.

NOTE: Attachments to Dr. von Braun's copy only.

NOTES 2-17-64 HOELZER

B 2/22

1. INDUSTRIAL OPERATIONS COMPUTER SUPPORT: The Data Center Branch is investigating with Industrial Operations personnel possible computer applications in the Industrial Operations area. We have observed considerable interest on the part of Industrial Operations personnel toward outside contracts with computer service firms for their support. We believe this is a mistake and are attempting to point out to the Industrial Operations the advantages of having a single Data Center approach for all MSFC.

Bob Young
I think Hoelzer is right
B

2. GE CONTRACT: The General Electric Company was selected by Mr. Webb for negotiation of the computer support services contract. Negotiations will begin today.

NOTES 2-17-64 Koelle

1. SATURN IB MARKET DEVELOPMENT: We had our meeting on the above subject this past Wednesday in Washington, with all program offices participating. It still does not look very encouraging for 1968 through 1970. OSSA can not foresee any requirements until 1970 and TITAN III competes for future jobs with the IB. OART is interested in launching a few (2 or 3) Fairchild-type payloads on lunar and planetary trajectories. The time for these missions has yet to be established. OMSF has strong hopes for an APOLLO follow-on program in Earth orbit with APOLLO X (30 days) or MORL (6-man lab). If we are optimistic, we can hope for 3 flights of the IB in 1968 and 4 flights in 1969. In my opinion the best argument still is that our 29 astronauts need more flight experience in Earth orbit than provided presently by the few APOLLO flights in the 1968/69 time period. It is obvious that flight proficiency in the space environment is probably the most important factor for a successful accomplishment of the lunar mission. Anyway, this would be our best sales argument, and you might want to use it when you have an opportunity.

2. STUDIES LOST IN THE SHUFFLE: As of now we still do not have authority to proceed with our studies, but we have lost the following:

a.	Advanced NOVA, Class III	600K
b.	Advanced NOVA, Class IV	400K
c.	SATURN V Lunar Logistics Vehicle	200K
d.	Interorbital Transfer Vehicle	200K
e.	Scientific Mission Support for Lunar Base (LESA)	100K
f.	Surface Vehicle Testbed (ALLS)	500K
g.	Mobile LESA (Large Mobile Lunar Laboratory)	200K
h.	Long Range Surface Vehicle	200K
i.	Operations Analysis of Advanced Lunar Transportation Systems	150K
j.	Manned Interplanetary Mission Survey Beyond Mars and Venus Missions	200K
k.	Feasibility Study of Global Transport	250K
l.	Reusable Lunar Ferry Vehicle	150K
m.	Low Acceleration Trajectory Manual	100K
	Total 10^3 $	3,250K

Our present estimate is to get about 9×10^6 total for FY 1964, out of which 3×10^6 will be administered by Mr. DeFries' office.

NOTES 2-17-64 KUERS

1. Saturn V, S-IC Stage:

a. We have welded the first Y-ring, out of three segments, using the Electron Beam process. Results are very encouraging with clear x-ray pictures. The welds are not yet perfect, some undercutting and short-arching occurred so that the penetration and build-up bead requires improvement. Also repeatability for uniform results and repair techniques have to be developed.

b. The installation of the fuel exclusion riser into the lower fuel bulkhead for the T-vehicle has been successfully completed. The bonding of the foamed blocks and the final adhesive cloth sealer was done using the vacuum bagging technique and heat lamps. The operation took 10 days continuous work, 24 hours a day.

c. The upper fuel bulkhead plus Y-ring has been welded to the skin section--also for the T-vehicle. The quality of this weld is acceptable with only a small number of porosity repairs required.

2. Saturn V, S-II Stage: As an in-house support for the S-II stage we are presently bonding a new P&VE designed light weight insulation on a 70" container. The insulation panels consisting of two layers of mylar and fiberglass honeycomb have also been fabricated in-house by use of our Autoclave.

Fw 2/17

NOTES 2-17-64 MAUS B 2/22

1. FY 65 MANPOWER RECLAMA - The presentation on MSFC's FY 65 Manpower Requirements was made to Dr. Mueller, Walter Lingle, Clyde Bothmer, Capt. Kahao and Capt. Ray Thompson. They listened intently, asked questions, and as expected, made no commitment, since it is uncertain whether NASA will get any spaces next year. ✓

2. MANNED SPACE VEHICLE COST STUDY - MSF has requested a study of launch vehicle costs for follow-on programs for Saturn IB and Saturn V at various launch rates (4, 6, 12, and 24 per year). We have proposed to MSF that the 24 per year rate be deleted from the study. A committee has been established to prepare the data. Mr. J. A. Bethay from my office will act as committee chairman and coordinator. ✓

3. NASA - CORPS OF ENGINEERS AGREEMENT FOR USE OF NASA PERT - With assistance of Tom Smith's office, NASA headquarters is developing an agency-wide standard agreement with the Corps of Engineers for use of NASA PERT in construction of NASA facilities. ✓

4. PROGRAM SCHEDULING AND REVIEW SYSTEM - The Committee for Review of MSF Scheduling and Review Procedures met last week in Washington. The Committee's position is:

   Present milestone charts will be amended to reflect "E" and "L" symbols (Expected date and Latest allowable date, derived from the PERT System). This is to be complete with the June 1964 submission.

   The MSF network should be validated by the Centers for logic, time estimates, and milestone selection.

   MSF is to work toward the establishment of an integrated scheduling system based on PERT and machine-generated schedule charts. Target date is Summer 1964 for being operational.

   After this takes place, the SARP schedule charts submission will be discontinued. ✓

NOTES 2-17-64 McCartney B 2/22

1. MANPOWER:

a. R&D Operations has verbally received a final increment of 55 civil service spaces, for a total of 155 new spaces received from Marshall's 370 FY-64 spaces. Internal allocation of the 55 spaces will be made on receipt of the voucher from EX-R.

b. The Technology Utilization function has been resolved. Ten personnel spaces will be permanently transferred from Research Projects Laboratory to Management Services.

2. YEAR-END UNENCUMBERED FUNDS STUDY:

As indicated in my 2-10 Notes, we planned to place $22M unencumbered Saturn V funds in "blocked" accounts. Additional laboratory effort has reduced that amount to $18M. We expect that Industrial Operations will not require any part of these funds.

NOTES 2-17-64 MRAZEK

1. RIFT: Contract NAS8-5600 (RIFT) was scheduled to be terminated and Contract NAS8-9500 (Advanced Vehicle Technology) scheduled to be effective 2-15-64.

2. NASA HAZARDS ADVISORY BOARD: It is understood that NASA Headquarters is considering the establishment of a NASA Hazards Advisory Board with representatives from the various Centers and from Headquarters. The purpose of the Board would be to maintain a continuous review over activities related to such hazards as blast, fireball, shrapnel, acoustics, and toxicity "to insure no important area of hazard investigation is overlooked, to insure that there is no duplication, and to facilitate ready exchange of hazards information throughout NASA." However, it appears from the current charter under consideration that the Board would have authority to cancel and/or direct Center activities in this area. To this, we have strong reservations. In any case, if such a board is set up, it is recommended that Dr. J. B. Gayle (Materials Division, this Laboratory) be appointed as the major MSFC representative.

WM Suggest we ask for draft of Charter for our comment B

3. WIND LOAD RESTRICTION FOR SA-201 AND SA-202: Chrysler Corporation Space Division has reported slightly negative safety margins for the S-IB-1 and S-IB-2 tanks (S-I-111 and S-I-112 tanks) with the 200K engines. A slight wind restriction for these vehicles will restore plus margins.

4. F-1 ENGINE: The first full-duration heat exchanger fired without incident. F-1 engine 014 was used; both helium and LOX were supplied, and no discrepancies occurred. Performance data has not been released.

NOTES 2-17-64 RUDOLPH

1. Program Directors Meeting:

I plan to participate in the tour of the West Coast contractor facilities during the week of 24 February, and will stay over in Los Angeles on 29 February and 1 March for the Program Directors Meeting.

2. Configuration Management Symposium:

There is a Configuration Management Symposium in Los Angeles during the week of 24 February sponsored by Space Technology Laboratories. Gen Sam Phillips is the overall Apollo Program Attendance Coordinator. I understand he will chairman one of the symposium workshops. Mr. Bradford, Mr. Ise and Mr. Goldston will attend from the Saturn V Project Office.

3. S-II Stage:

Cost Proposals - Action by the contractor to preclude late submission of firm cost proposals has produced significant results. The contractor has produced approximately one proposal per day during the last month. The burden is now on the Project Office and the Contracts Office for prompt evaluation and negotiation.

Weight Reduction - A deadline date of 17 March for definition of all proposed S-II Stage weight reduction items was set during the S-II Quarterly Review.

4. S-IVB Telemetry:

A decision has been made to supply Douglas certain telemetry equipment on a loan basis to meet their immediate needs. Douglas will purchase telemetry equipment according to MSFC drawings and specifications. MSFC is accepting responsibility for component qualification.

5. Instrument Unit:

Contract negotiations began with IBM to finalize letter contracts for prototype and breadboard computers and data adapter, on 11 February 1964.

fw 2/17

NOTES-2-17-64-SHEPHERD B 2/22

No Notes

NOTES 2-17-64 Stuhlinger

B 2/22

1. SA-10 PAYLOAD: Milton Ames (OART) gave a brief status review of the SA-10 payload project to Dr. Mueller's MSF Experiment Board on February 11; I described our present SA-10 payload plans in detail. Dr. Mueller's reactions: a) our cost estimate of $15 million is too low; b) OMSF will not fund more of this project than the bare vehicle; c) OART should present a firm statement regarding experiments to be flown, and availability of funds; d) OSSA should endorse the payload; e) no biological experiment (mouse house) should be flown.

OART and MSFC will jointly prepare the answer to (a), (c), and (d). It is hoped that Dr. Mueller will give his approval to the SA-10 project not later than the week of February 17.

2. ART AND SRT PROGRAM DIGEST: An updating of each task description (a total of 317 tasks) within the Marshall ART and SRT programs was completed and forwarded to OART to be used for the publication of an agency-wide program digest. Included in this exercise were such details as complete correlation between FY-63 and FY-64 programs and up-to-date contractual information. As soon as additional copies of this submission are reproduced, we plan to distribute them throughout Marshall.

3. SRT PROGRAM STATUS: The current status of each program managed by RPL as of February 13, 1964, is noted in the table below.

	ANNUAL PLAN	PROGRAM AUTHORITY	PROCESSED TO FMO	OBLIGATED
OART	9,659,000	6,944,283	5,700,000	728,000
OMSF	14,080,000	14,080,000	2,560,757	7,554
OSSA	675,000	675,000	230,538	3,482
	24,414,000	21,699,283	8,491,295	739,036

OART indicated that the remainder of the Annual Plan will be forwarded as Program Authority within a few days.

4. ORBITAL RESEARCH LABORATORY: In a recent meeting at NASA Headquarters, chaired by Dr. Leo Werner, OART, a working group was formed to determine appropriate engineering experiments for ORL. LaRC, MSC, MSFC, and OART are represented on the working group, the MSFC member being Mr. Jerry Johnson of RPL. Mr. Johnson coordinates this work closely with Mr. J. Carter of FPO.

Also, an experiment management committee was formed, without MSFC membership, to coordinate the integration of experiments proposed by the three working groups on scientific, biomedical, and engineering experiments.